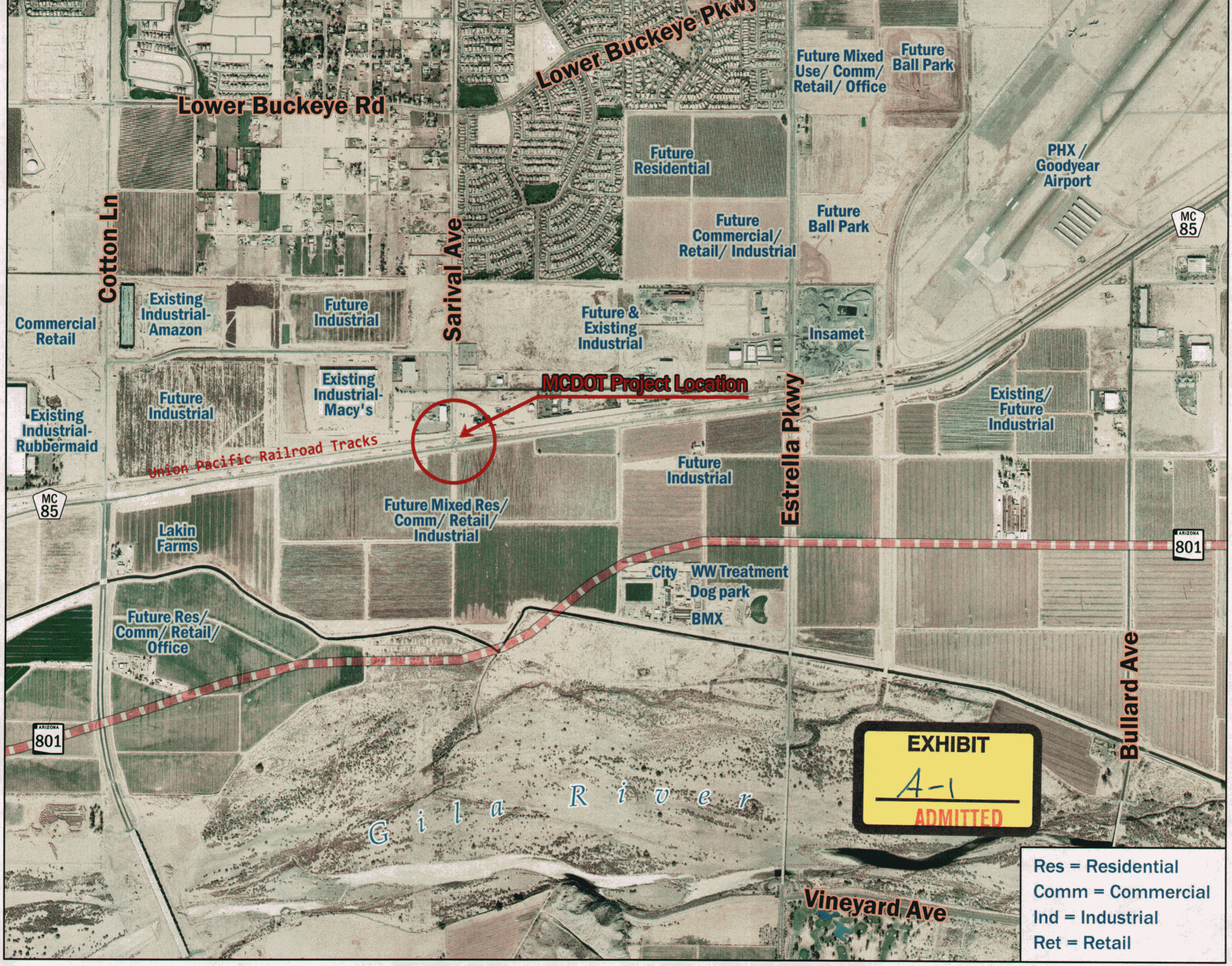
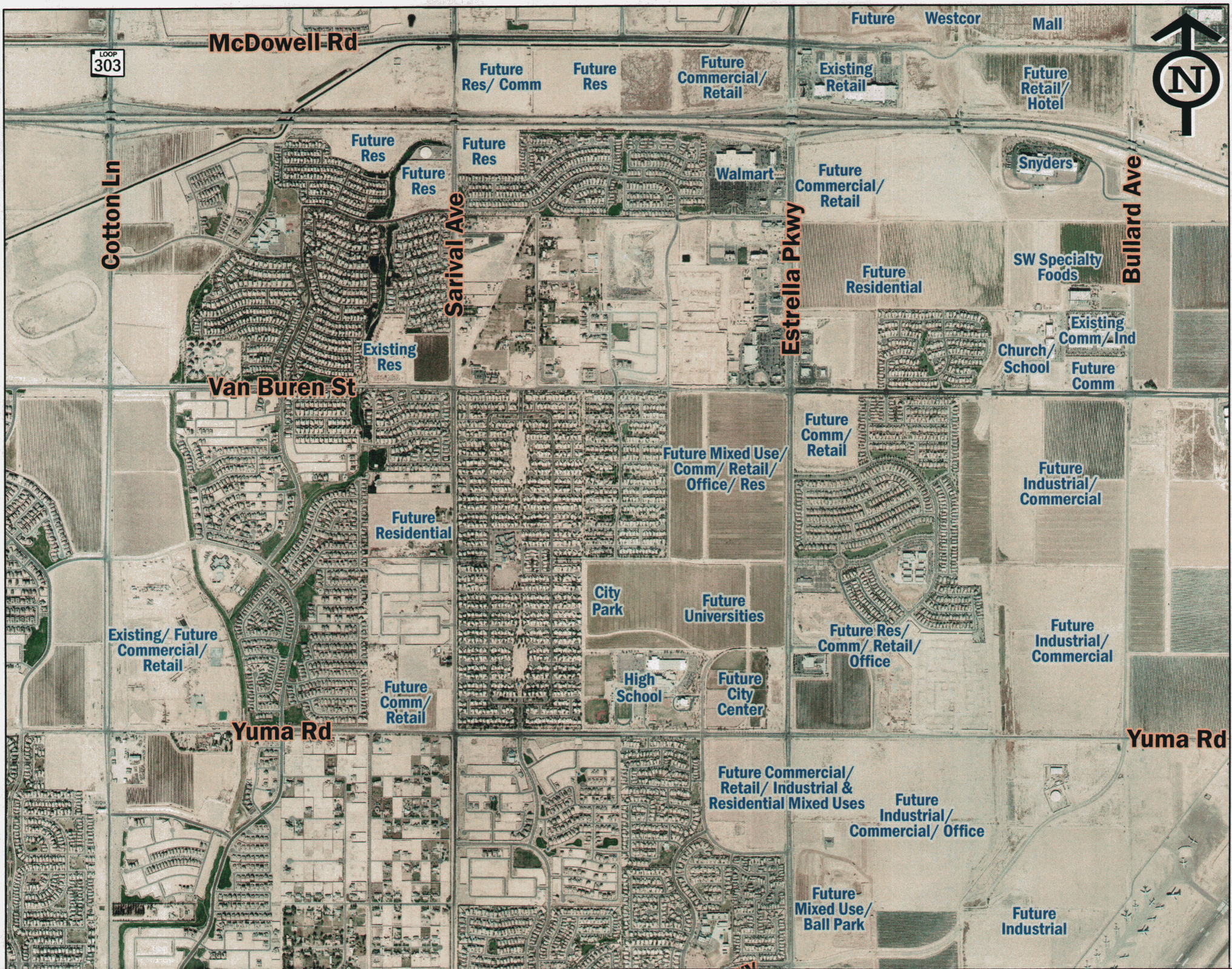
Transcript Exhibit(s)

Docket #(s): RR-03639A-08-0311

Exhibit # : A1-A4, S1


Lower Buckeye Rd
Lower Buckeye Pkwy
Future Mixed Use/ Comm/ Retail/ Office
Future Ball Park
Future Residential
PHX / Goodyear Airport
Cotton Ln
Sarival Ave
Future Commercial/ Retail/ Industrial
Future Ball Park
MC 85
Existing Industrial- Amazon
Future Industrial
Future & Existing Industrial
Insamet
Commercial Retail
MCDOT Project Location
Existing Industrial- Macy's
Future Industrial
Existing/ Future Industrial
Existing Industrial- Rubbermaid
Union Pacific Railroad Tracks
Estrella Pkwy
Future Industrial
Future Mixed Res/ Comm/ Retail/ Industrial
Lakin Farms
ARIZONA 801
City WW Treatment
Dog park
BMX
Future Res/ Comm/ Retail/ Office
Bullard Ave
Gila River
Vineyard Ave
EXHIBIT
A-1
ADMITTED
Res = Residential
Comm = Commercial
Ind = Industrial
Ret = Retail


McDowell Rd
LOOP 303
Future Res/ Comm
Future Res
Future Commercial/ Retail
Future
Westcor
Mall
Existing Retail
Future Retail/ Hotel
N
Cotton Ln
Future Res
Future Res
Future Res
Sarival Ave
Walmart
Future Commercial/ Retail
Snyders
Estrella Pkwy
Bullard Ave
Future Residential
SW Specialty Foods
Existing Comm/ Ind
Church/ School
Future Comm
Existing Res
Van Buren St
Future Comm/ Retail
Future Mixed Use/ Comm/ Retail/ Office/ Res
Future Industrial/ Commercial
Future Residential
City Park
Future Universities
Future Res/ Comm/ Retail/ Office
Future Industrial/ Commercial
Existing/ Future Commercial/ Retail
High School
Future City Center
Future Comm/ Retail
Yuma Rd
Yuma Rd
Future Commercial/ Retail/ Industrial & Residential Mixed Uses
Future Industrial/ Commercial/ Office
Future Mixed Use/ Ball Park
Future Industrial

Memorandum

1501 W. Fountainhead Parkway, Ste 400
Tempe, Arizona 85282

To: Arizona Corporation Commission Office of Railroad Safety
Attn: Chris Watson
2200 N. Central Avenue, Ste 300
Phoenix, Arizona 85004

Date: June 16, 2008

Subject: Arizona Corporation Commission
Application for Union Pacific Railroad
at Grade Crossing Improvements at Sarival Avenue

Project: MC 85, Cotton Lane to Estrella Parkway

Project: MCDOT On-Call Contract 2006- 069 Task E
Number: MCDOT Project Number TT-083

From: Doug LaMont, P.E. Douglas J LaMont

This memo is submitted to the Arizona Corporation Commission (ACC) as an application to request and upgrade to an existing Union Pacific Railroad (UPRR) crossing on behalf of the Maricopa Department of Transportation (MCDOT).

i. Location of Crossing

The MC 85, Estrella Parkway to Cotton Lane project includes the improvements of MC 85 to a six lane roadway including traffic signalization of the MC 85 and Sarival Avenue intersection, improvements along Sarival Avenue to a four lane roadway and a 10.5-ft wide raised median across the UPRR right-of-way. The UPRR and Sarival Avenue crossing is located approximately 200-ft north of MC 85 and 2,400-ft south of West Elwood Street. The UPRR and MCDOT have a signed agreement (May 2008) to widen the existing an at-grade crossing.

ii. Why the Crossing is Needed

The railroad crossing along Sarival Avenue is an existing at grade public road crossing. The project is a roadway widening of the existing roadway which necessitates the widening of the existing crossing.

iii. Why the Existing Crossing Cannot be Grade Separated

With the proposed improvements to the intersection of MC 85 and Sarival Avenue and the close proximity of the railroad crossing from the proposed intersection (approximately 200-ft north of MC 85) the location of the at-grade crossing remains unchanged. A grade separation would have the following undesirable consequences.1) Access to existing businesses along Sarival Avenue would be severed for approximately 2,300-ft north of the railroad tracks; 2) Access to existing farm fields along MC 85 would be severed for approximately 4,600-ft along MC 85 (2,300-ft east and west of Sarival Avenue); 3) There are several existing utilities in Sarival Avenue that cannot support 30-ft of additional embankment needed for a grade-separated crossing; and 4) There is insufficient right-of-way to accommodate 30-ft high embankment slopes along Sarival Avenue and MC 85.

iv. Type of Warning Devices to be Installed

The warning devices for northbound and southbound traffic included in the design are as follows: gates with flashing lights will be installed in the median and outside the roadway near the sidewalk; cantilever flashing railroad signals will be installed outside the roadway near the sidewalk; signal preemption devices will be installed by the UPRR to and timed with the traffic signal to allow the intersection to clear prior to the train passing; and railroad crossing warning signs will be placed per MUTCD, Part 8 Standards.

v. Who will maintain the Crossing Warning Devices

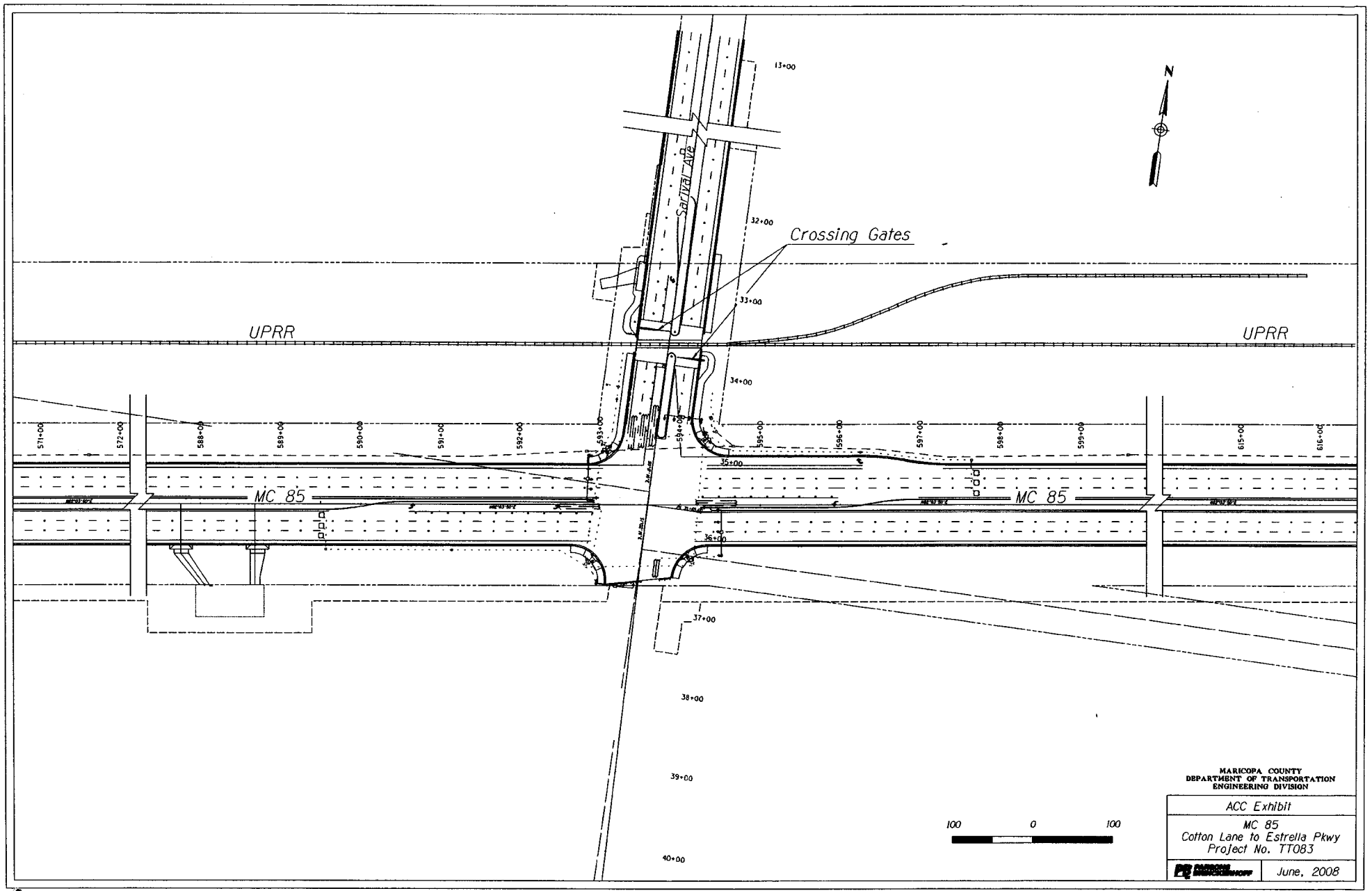
UPRR will own and maintain the physical elements of the crossing (crossing surface, gates, flashing lights). MCDOT will own and maintain the approaching surface, signing and movement markings on Sarival Avenue and MC 85.

vi. Who is Funding the Project

MCDOT and the City of Goodyear are funding the project.

CC: Kelly Roy/MCDOT

EXHIBIT
A-2
ADMITTED


13+00
Sarival Ave
32+00
Crossing Gates
33+00
UPRR
UPRR
34+00
571+00
572+00
588+00
589+00
590+00
591+00
592+00
593+00
594+00
595+00
596+00
597+00
598+00
599+00
615+00
619
35+00
MC 85
MC 85
36+00
37+00
38+00
39+00
40+00
N
100
0
100
MARICOPA COUNTY
DEPARTMENT OF TRANSPORTATION
ENGINEERING DIVISION
ACC Exhibit
MC 85
Cotton Lane to Estrella Pkwy
Project No. TT083
June, 2008

July 17, 2008

Mr. Chris Watson
Railroad Safety
Arizona Corporation Commission
2200 North Central Avenue, Suite 300
Phoenix, AZ 85004

Mr. Charles H. Hains
Attorney
Arizona Corporation Commission
1200 West Washington Street
Phoenix, AZ 85007

Re: MC 85, Cotton Lane to Estrella Parkway
Responses to the First Set of Data Requests to Union Pacific Railroad Company
Docket No. RR-03639A-08-0311

Below are the responses to the first set of data requests of the Arizona Corporation Commission staff dated June 25, 2008regarding the above referenced Maricopa County Department of Transportation project.

CW 1.1 Provide Average Daily Traffic Counts for each of the locations.
Response: From the Maricopa Department of Transportation website, the 2006 Sarival Avenue ADT at the intersection of MC 85 is 1,656 vpd. (See Attachment A).

Maricopa Association of Governments (MAG) 2030 projections at Sarival Avenue is 6,099 VPD. (See Attachment B).

CW 1.2 Please describe the current Level of Service (LOS) at each intersection.
Response: Taken from the *July 1998 MC Highway 85, State Route 85 at Oglesby to 75th Avenue Final Corridor Improvement Study, Section 3.2.2 Unsignalized Intersections*, the intersection of MC 85 and Sarival Avenue operates at Level of Service A in the existing condition utilizing the 1997 ADT's.

Taken from the *July 2006 Access Control and Corridor Improvement Study, MC 85 75th Ave to Turner Rd, Section 3.3 Future Year Conditions and Level of Service* the intersection of MC 85 and Sarival Avenue will operate at a LOS B utilizing 2026 projected traffic data. This analysis assumed that MC 85 will be upgraded to a six lane roadway section.

CW 1.3 Provide any traffic studies done by the road authorities for each area.

EXHIBIT A-3 ADMITTED

Response: Two design documents covering the crossing area were prepared for MCDOT and are listed below:

1. July 1998 *MC Highway 85, State Route 85 at Oglesby to 75th Avenue Final Corridor Improvement Study, Section 3 Traffic and Accident Data* prepared by Sverdrup Inc.
2. The July 2006 *Access Control And Corridor Improvements Study, MC 85 75th Ave to Turner Rd* prepared by DMJM Harris.

The traffic analysis sections from both reports are provided as Attachments C and D, respectively.

CW 1.4 Provide the population of the City the crossing is located in.

Response: From the City of Goodyear web site, the population in the City is 56,000. (See Attachment E).

CW 1.5 Provide what warning devices are currently installed at the crossing.

Response: The warning devices currently installed for northbound and southbound traffic include: gates with flashing lights and cantilever flashing railroad signals outside the roadway pavement; and railroad crossing warning signs.

CW 1.6 Provide distances in miles to the next public crossing on either side of the proposed project location. Are any of these grade separations?

Response: Cotton Lane crossing is 1 mile to the west, and the Estrella Parkway crossing is 1 mile to the east. Both crossings are at-grade crossings.

CW 1.7 How and why was grade separation not decided on at this time? Please provide any studies that were done to support these answers.

Response: No studies were performed to evaluate if an overpass was required. With the proposed improvements to the intersection of MC 85 and Sarival Avenue and the close proximity of the railroad crossing from the proposed intersection (approximately 200-ft north of MC 85) the location of the at-grade crossing remains unchanged. A grade separation would have the following undesirable consequences.1) Access to existing businesses along Sarival Avenue would be severed for approximately 2,300-ft north of the railroad tracks; 2) Access to existing farm fields along MC 85 would be severed for approximately 4,600-ft along MC 85 (2,300-ft east and west of Sarival Avenue); 3) There are several existing utilities in Sarival Avenue that cannot support 30-ft of additional embankment needed for a grade-separated crossing; and 4) There is insufficient right-of-way to accommodate 30-ft high embankment slopes along Sarival Avenue and MC 85.

CW 1.8 If this crossing was grade separated, provide a cost estimate of the project.

Response: Our initial calculations yield a cost of $20,000,000 to construct a grade separated crossing. The estimate includes the cost for a bridge over the UPRR tracks; the

cost for retaining walls along the east and west legs of MC 85 and the north leg of Sarival Avenue in order to retain slopes within the existing right of way; the cost for new right of way along the south leg of Sarival Avenue as the County does not have any existing right of way along the south leg of Sarival Avenue; and the cost to reconstruct Sarival Avenue as needed due to the bridge construction.

CW 1.9 Please describe what the surrounding areas are zoned for near this intersection. i.e. Are there going to be new housing developments, industrial parks etc.

Response: The parcels north of the railroad crossings are identified as City Code Zone I-2 - General Industrial Park, and the parcels to the south of the tracks are identified as City Zone Code PAD- Planned Area Development, which are intended to accommodate and promote residential and non residential developments. The area to the south of the tracks is currently farm land but residential developments are anticipated.

CW 1.10 Please supply the following: number of daily train movements through the crossing, speed of the trains, and the type of movements being made (i.e. thru freight or switching). Is this a passenger train route?

Response: From a July 16, 2008 email from Steve Newman with the UPRR, there is an average of 2-3 trains per day, and the timetable speed is 25mph. The UPRR is the only rail company authorized to use the track.

CW 1.11 Please provide the names and locations of all schools (elementary, junior high and high school) within the area of the crossing.

Response: The Sarival Avenue crossing is in the Avondale Elementary School District No. 44 and Agua Fria Union High School District.
The following are the schools in the districts:

High Schools:

Agua Fria Union High School, 750 East Riley Drive, Avondale 85323
Estrella High School, 5100 N. Central Ave, Avondale, 85323

Elementary Schools:

Centerra Mirage School , 15151 W Centerra Dr. South Goodyear, AZ 85338
Desert Star School , 2131 South 157th Avenue Goodyear, AZ
Desert Thunder School , 16750 W. Garfield Goodyear, AZ 85338
Lattie Coor School , 1406 N. Central Avenue Avondale, AZ 85323
Michael Anderson School, 45 S. 3rd Ave, Avondale, AZ 85323
Wildflower School, 325 S. Wildflower Drive, Goodyear AZ 85338
Copper trails School, 16875 West Canyon Trails Blvd, Goodyear, AZ 85338
Eliseo C. Felix School, 540 La Pasada Goodyear, AZ 85338

CW 1.12 Please provide school bus route information concerning the crossing, including the number of times a day a school bus crosses this crossing.

1501 W. Fountainhead Parkway
Suite 400
Tempe, AZ 85282
480-966-8295
Fax: 480-966-9234

Response: Per phone conversation with Lynn Rumble (Avondale Elementary School District Transportation Supervisor), there is one school bus that crosses the intersection twice daily.

CW 1.13 Please provide information about any hospitals in the area and whether the crossing is used extensively by emergency service vehicles, also how far away the hospitals are from the crossing.

Response: The main hospital in the area is West Valley Hospital located at 13677 W. McDowell Road, Goodyear, Arizona 85395, which is approximately 7.5 miles away from the intersection. Per a phone conversation with the hospital, we were advised that the emergency service vehicles select their route based on the shortest distance to their destination.

CW 1.14 Please provide total cost of the railroad improvements to each crossing.

Response: It is estimated that the cost for the railroad crossing improvements will be $575,057.

CW 1.15 Provide any information as to whether vehicles carrying hazardous materials utilize this crossing and the number of times a day they might cross it.

Response: We are unable to provide specific traffic counts for vehicle carrying hazardous materials. Based on information from the Maricopa County department of Transportation, there are no restrictions on vehicles carrying hazardous materials on this roadway. Sarival Avenue is not registered in the National Hazardous Material Route Registry.

CW 1.16 Please provide the posted vehicular speed limit for the roadway.

Response: Posted speed is 45 mph.

CW 1.17 Do any buses (other than school buses) utilize the crossing, and how many times a day do they cross the crossing.

Response: Valley Metro does not have Sarival Avenue on its routes. The closest bus line route is along Litchfield Road, which is located approximately 4 miles east of the RR crossing.

CW 1.18 Please indicate whether any spur lines have been removed within the last three years inside a 10 mile radius of any crossings covered in this application. Please include the reason for the removal, date of the removal and whether an at-grade crossing or crossings were removed in order to remove the spur line.

Response: We were unable to get this information from the UPRR. As soon as this information becomes available, we will amend the response to this question.

CW 1.19 Please fill in the attached FHWA Grade Separation Guidelines Table, (from FHWA's 2007 revised second edition Railroad Highway Grade-Crossing

Handbook, page 151) with a yes or no answer as to weather each item applies. Also, please provide all information to support your answers of yes or no (i.e. vehicle delay numbers, any calculations that were performed to get the answers).

Response: See Attachment F for FHWA form and support calculations.

CW 1.20 Based on the current single track configuration at the crossings specified by this application, please provide the current traffic blocking delay per train. Please indicate the time in which vehicular traffic is delayed (1) to allow the train to pass at a crossing and (2) due to trains stopped on the track for any purpose. The delay is measured from the point that the warning devices are activated at the crossing to the time after the train has cleared the crossing and the warning devices are reset.

Response:

1) Traffic blocking delay **per train** is 282 seconds for a **train passing** the crossing (0.42 veh-hr per train).
2) Traffic blocking delay **per train** is 635 seconds for a **train stopped** at the crossing (2.15 veh-hr per train).
(See Attachment F for Delay calculations).

Please contact me at 480.966.8295 should you have any questions or if you need additional information regarding the above responses.

Sincerely,

PB Americas, Inc.

Douglas J. LaMont

Doug LaMont, P.E.
Project Manager

CC: Sami Ayoub- MCDOT Project Manager
Kelly Roy-MCDOT Utility Coordinator
File: 1193, Task E

ATTACHMENT A

2006 ADT

Quick Links

- Adopt-a-Highway
- Approved Materials List
- Bicycle Program
- Design & Construction Procurement
- Employment Opportunities
- Improvement Districts
- Land Survey Section
- Project News & Updates
- Property Mgmt / Excess Property / Auctions
- Public Meetings
- Traffic Counts
- Transportation Advisory Board
- Transportation Planning Studies

- Arizona Counties:
  Select a County
- Valley Cities & Towns:
  Select a City or Town

Plans & Manuals

- CADD Standards
- City Limits Maps
- Manuals
- Transportation Improvement Program (TIP)

Active Studies

- 163rd Avenue Corridor Improvement Study
- New River Road Corridor Improvement Study
- Jomax Road Corridor Improvement Study
  (Tillman Blvd Alignment to Future Loop 303)

Back to Traffic Counts Main Page

Page 1 - 2

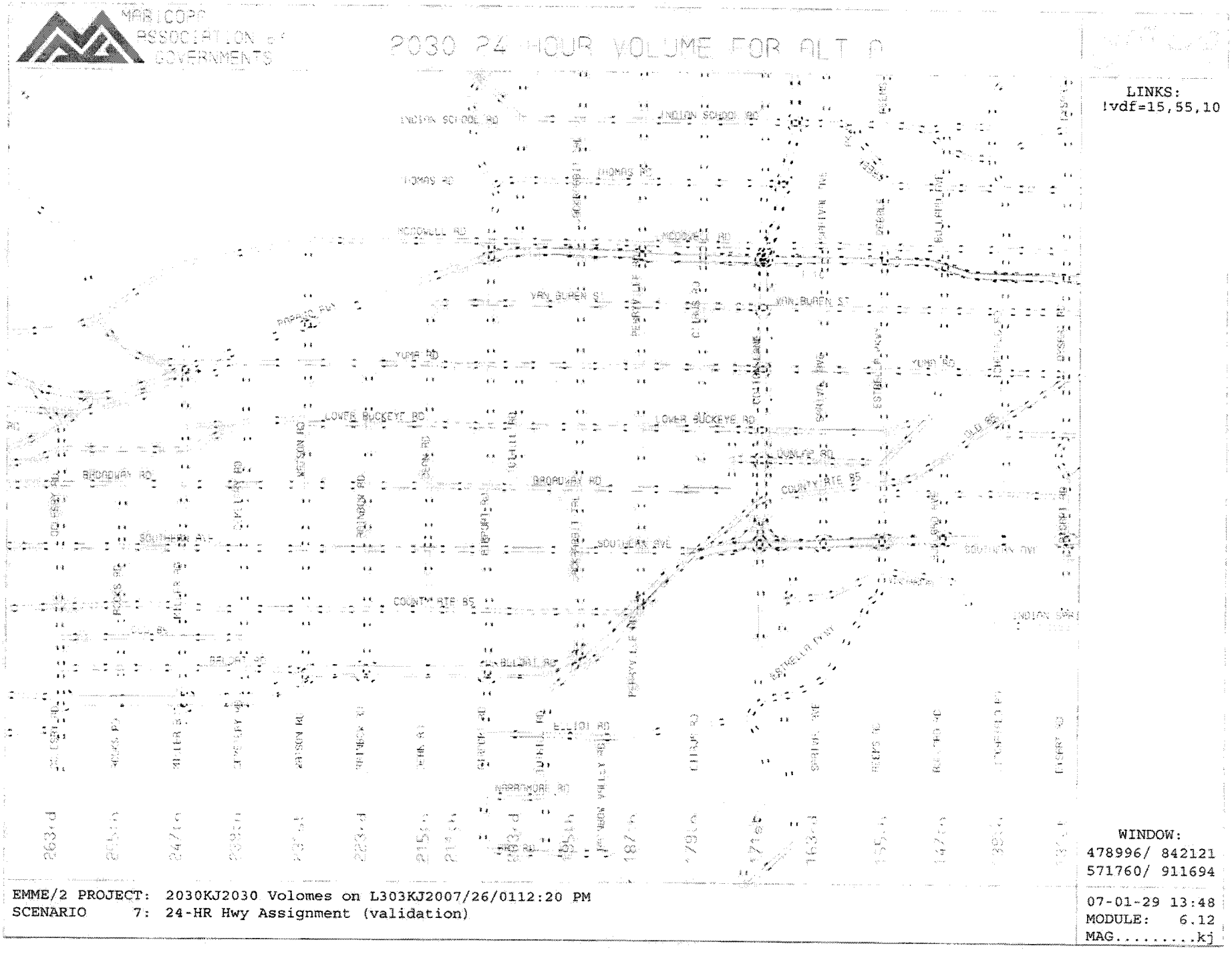
Date	On Road	Direction	Ref Road	Travel	ADT 2006	2006 AM Hour	2006 AM Volun
11/7/2006	SADDLE RD	E	ROCKY POINT RD	B	17	600	3
11/28/2006	SALOME HWY	W	379TH AVE	B	1145	1100	70
10/17/2006	SALOME HWY	W	411TH AVE	B	718	1000	66
	SALOME HWY	N	BASELINE RD	B	NC		
8/24/2006	SALOME HWY	N	CAMELBACK RD	B	61	1000	8
8/23/2006	SALOME HWY	S	EAGLE EYE RD	B	596	1100	72
8/23/2006	SALOME HWY	N	I 10	B	572	700	32
10/17/2006	SALOME HWY	S	I-10	B	95	500	15
10/18/2006	SALOME HWY	S	INDIAN SCHOOL RD	B	51	800	6
10/18/2006	SALOME HWY	W	INDIAN SCHOOL RD	B	62	400	6
9/14/2006	SALOME HWY	N	OLD US 80	B	619	900	57
11/28/2006	SALOME HWY	E	WINTERSBURG RD	B	1558	600	140
9/19/2006	SAN TAN BLVD	W	ELLSWORTH RD	B	2437	700	182
3/7/2006	SAN TAN BLVD	E	HIGLEY RD	B	2684	800	228
3/7/2006	SAN TAN BLVD	E	POWER RD	B	3829	700	269
3/7/2006	SAN TAN BLVD	E	SOSSAMAN RD	B	3301	700	233
3/7/2006	SAN TAN BLVD	E	TANGELO AVE	B	2458	700	195
5/4/2006	SANTA CRUZ RD	E	BELTLINE RD	B	450	1000	25
1/17/2006	SANTA FE DR	W	99TH AVE	B	1810	1000	177
4/10/2006	SARIVAL AVE	N	BETHANY HOME RD	B	2597	700	272
12/11/2006	SARIVAL AVE	N	CACTUS RD	B	2936	600	341
12/11/2006	SARIVAL AVE	N	CAMELBACK RD	B	3111	700	304
	SARIVAL		GLENDALE				

5/1/2006	AVE	N	AVE	B	2076	600	193
6/15/2006	SARIVAL AVE	N	MC 85	B	1656	800	120
	SARIVAL AVE	S	MC 85	B	NC		
5/1/2006	SARIVAL AVE	N	OLIVE AVE	B	2170	600	288
	SARIVAL AVE / 163RD AVE	N	US 60	B	A		
	SARIVAL AVE	N	VAN BUREN ST	B	NC		
	SARIVAL AVE	N	YUMA RD	B	NC		
	SEVEN SPRINGS RD	N	BARTLETT DAM RD	B	A		
7/10/2006	SEVEN SPRINGS RD	S	CAVE CREEK RD	B	192	700	19
2/13/2006	SIGNAL BUTTE RD	N	BROADWAY RD	B	15627	1000	868
2/22/2006	SIGNAL BUTTE RD	N	BROWN RD	B	770	700	69
3/29/2006	SIGNAL BUTTE RD	N	OCOTILLO RD	B	3300	700	615
2/28/2006	SIGNAL BUTTE RD	N	UNIVERSITY DR	B	5298	700	396
2/28/2006	SIGNAL BUTTE RD	N	US 60	B	10081	800	624
10/31/2006	SISSION RD	E	363RD AVE	B	25	800	2
3/21/2006	SOSSAMAN RD	N	CHANDLER HEIGHTS RD	B	5328	700	408
	SOSSAMAN RD	N	ELLIOT RD	B	A		
3/21/2006	SOSSAMAN RD	N	OCOTILLO RD	B	6319	700	490
3/22/2006	SOSSAMAN RD	S	RIGGS RD	B	2912	600	201
5/23/2006	SOUTHERN AVE	E	35TH AVE	B	9573	700	542

For Average Daily Traffic counts for 2005-1999.

ATTACHMENT B

MAG 2030 PROJECTION


MARICOPA ASSOCIATION of GOVERNMENTS
2030 24-HOUR VOLUME FOR ALT 0
LINKS:
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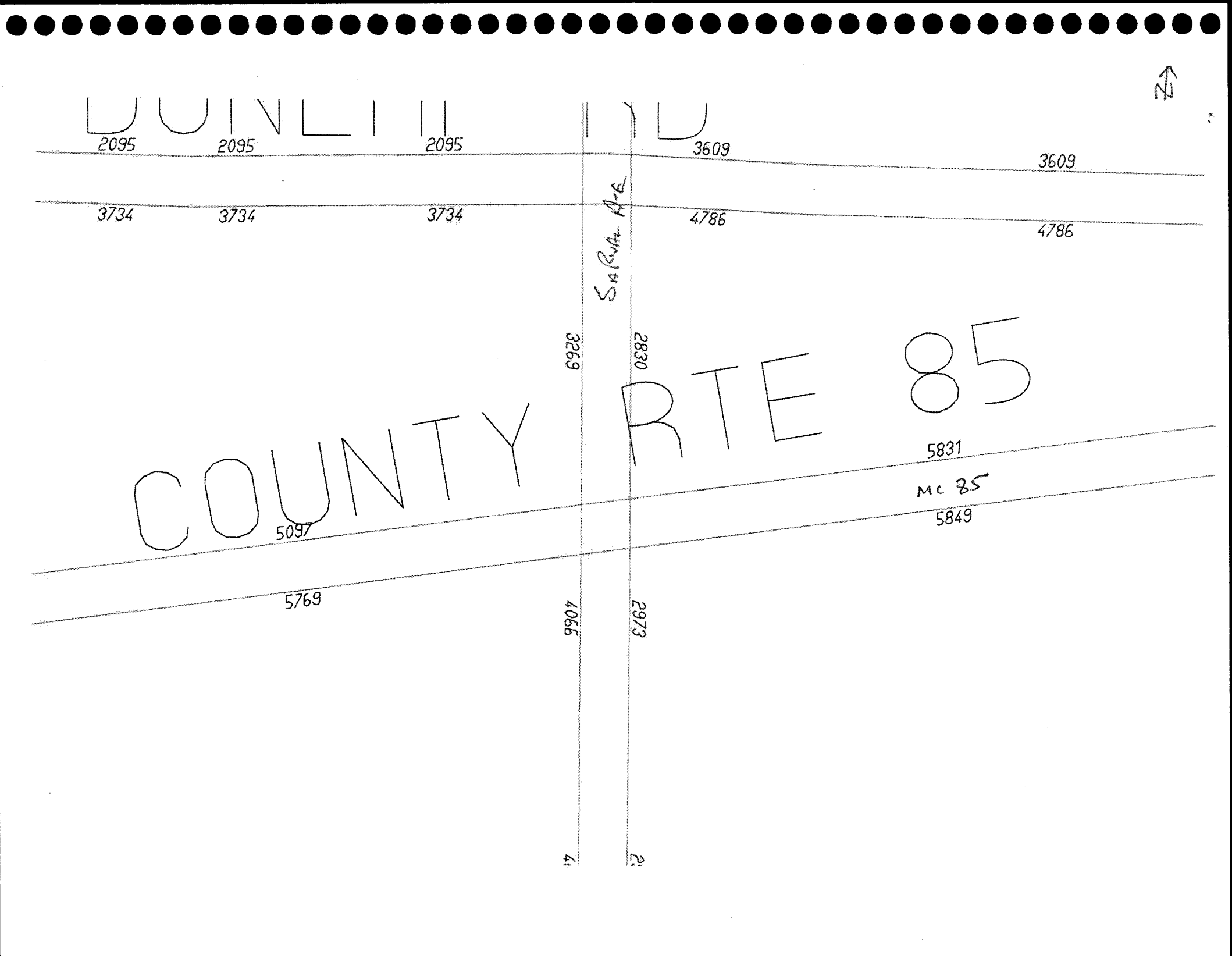
INDIAN SCHOOL RD
THOMAS RD
MCDOWELL RD
VAN BUREN ST
YUMA RD
LOWER BUCKEYE RD
BROADWAY RD
SOUTHERN AVE
COUNTY RTE 85
BELL RD
ELLIOT RD
MAGNOLIA FWY
WINDOW:
478996/ 842121
571760/ 911694
07-01-29 13:48
MODULE: 6.12
MAG.....kj
EMME/2 PROJECT: 2030KJ2030 Volomes on L303KJ2007/26/0112:20 PM
SCENARIO 7: 24-HR Hwy Assignment (validation)


2095
2095
2095
3609
3609
3734
3734
3734
4786
4786
Sabrina Ave
3269
2830
COUNTY RTE 85
5831
MC 85
5849
5097
5769
4066
2973

ATTACHMENT C

MC HIGHWAY 85
STATE ROUTE 85 AT OGLESBY TO 75TH AVENUE
FINAL CORRIDOR IMPROVEMENT STUDY

SECTION 3 TRAFFIC AND ACCIDENT DATA

SECTION 3.0
TRAFFIC AND ACCIDENT DATA

3.1 General

The following subsections contain summaries of data contained in the Traffic Analysis Report and the Transyt-7f Analysis Technical Memorandum. The Traffic Analysis Report is a separate document which accompanies this study. The Technical Memorandum is contained in Appendix O. Existing traffic and accident data are summarized in Sections 2.2.7 and Sections 2.2.8.

3.2 Existing Level of Service

3.2.1 MC 85 1997 ADT's: The 1997 ADT's for MC 85 are summarized in Table 3.1 below. The traffic volumes generally increase from west to east along MC 85. The highest volume is from 83rd Avenue to 75th Avenue.

TABLE 3.1
MC 85 1997 AVERAGE DAILY TRAFFIC

Location	Number of Lanes	Average Daily Traffic(ADT)
SR 85 to Rooks Road	2	3,500
Rooks Road to Miller Road	2	3,500
Miller Road to Apache Road	4	6,000
Apache Road to Watson Road	4	6,000
Watson Road to Rainbow Road	4	6,000
Rainbow Road to Dean Road	4	6,000
Dean Road to Airport Road	4	6,000
Airport Road to Jackrabbit Trail	4	6,000
Jackrabbit Trail to Perryville Road	2	6,000
Perryville Road to Southern Avenue	2	6,000
Southern Avenue to Cotton Lane	2	6,000
Cotton Lane to Sarival Avenue	2	5,000

Sarival Avenue to Estrella Parkway	2	5,000
Estrella Parkway to Bullard Avenue	2	7,200
Bullard Avenue to Litchfield Road	2	7,200
Litchfield Road to Dysart Road	5	9,000
Dysart Road to El Mirage Road	5	8,200
El Mirage Road to 115th Avenue	5	8,200
115th Avenue to 107th Avenue	5	8,200
107th Avenue to 99th Avenue	4	8,200
99th Avenue to 91st Avenue	4	9,000
91st Avenue to 83rd Avenue	4	9,000
83rd Avenue to 75th Avenue	4	11,500

3.2.2 Unsignalized Intersections: Fifteen unsignalized intersections along the MC 85 corridor were analyzed for levels of service. Level of Service (LOS) A, which is the best level of service, requires an average total delay per vehicle of less than 5 seconds. All the intersections analyzed have average total delays considerably less than 5. The highest delays were in the AM and PM peak hours at the intersection of Miller Road (2.6 and 3.0 seconds, respectively), the PM peak at the intersection of Estrella Parkway (2.4 seconds) and the PM peak at the intersection of Baseline Road (2.1 seconds).

3.2.3 Signalized Intersections: Fourteen signalized intersections along the MC 85 corridor were analyzed for level of service. For LOS A, the average total delay per vehicle is less than 5 seconds, while LOS B, which still provides efficient traffic operation, the average total delay per vehicle is less than 15 and more than 5 seconds. Most of the intersections analyzed operate at a LOS B. The highest delays were in the AM and PM peak hours at the 83rd Avenue Intersection (7.2 and 9.2 seconds respectively), and the AM and PM peak hours at the 75th Avenue Intersection (7.3 and 8.0 seconds).

3.2.4 Two-Lane Highway Segments: The two-lane highway segments of the MC 85 corridor are located from SR 85 to Miller Road and from west of Jackrabbit Trail to Litchfield Road. These roadway segments generally operate at LOS A in the AM peak hour and LOS B in the PM peak hour.

3.2.5 Multi-Lane Highway Segments: The multi-lane highway segments of the MC 85 corridor are located from Miller Road to Jackrabbit Trail and from Litchfield Road to 75th Avenue, all operate at LOS A.

3.3 2005 Level of Service

3.3.1 MC 85 2005 ADT's: The 2005 ADT projections for MC 85 are summarized in Table 3.2 below. The highest volume locations are from Cotton Lane to Litchfield Road and from 99th Avenue to 75th Avenue.

TABLE 3.2
MC 85 2005 AVERAGE DAILY TRAFFIC

Location	Average Daily Traffic(ADT)
SR 85 to Rooks Road	4,100
Rooks Road to Miller Road	4,100
Miller Road to Apache Road	7,000
Apache Road to Watson Road	9,100
Watson Road to Rainbow Road	9,100
Rainbow Road to Dean Road	8,600
Dean Road to Airport Road	8,600
Airport Road to Jackrabbit Trail	8,600
Jackrabbit Trail to Perryville Road	8,900
Perryville Road to Southern Avenue	8,600
Southern Avenue to Cotton Lane	8,600
Cotton Lane to Sarival Avenue	10,600
Sarival Avenue to Estrella Parkway	13,700
Estrella Parkway to Bullard Avenue	14,300
Bullard Avenue to Litchfield Road	14,300
Litchfield Road to Dysart Road	12,300
Dysart Road to El Mirage Road	11,200
El Mirage Road to 115th Avenue	11,200
115th Avenue to 107th Avenue	11,200

107th Avenue to 99th Avenue	11,200
99th Avenue to 91st Avenue	13,100
91st Avenue to 83rd Avenue	13,100
83rd Avenue to 75th Avenue	16,400

3.3.2 Unsignalized Intersections: Fifteen unsignalized intersections along the MC 85 corridor were analyzed for level of service using 2005 traffic projections. Significant intersection delays are projected to occur during peak periods at Baseline Road and Lower Buckeye Road. Each of these locations is identified in the traffic report for consideration for traffic signal control.

3.3.3 Signalized Intersections: Fourteen existing signalized intersections along the MC 85 corridor, and Estrella Parkway, Baseline Road, and Lower Buckeye Road intersections were analyzed for level of service. The MC 85 intersections will operate at LOS B or better with 2005 project volumes.

3.3.4 Two-Lane Highway Segments: The two-lane highway segment from SR 85 to Miller Road will operate at LOS A with the 2005 projected traffic volumes. The projected 2005 volumes indicate that the segment of MC 85 from Jackrabbit Trail to Sarival will provide a LOS B in the AM peak hour while the PM peak hour traffic will operate at LOS C. The two-lane segment from Sarival Avenue to Litchfield Road will operate at LOS C in the AM peak, while the PM peak hour traffic slips to LOS D. LOS C is generally considered to be the minimum acceptable level of service when designing rural and suburban roadways. Increasing the capacity of this segment of roadway prior to 2005 is recommended.

3.3.5 Multi-Lane Highway Segments: The multi-lane highway segments of the MC 85 corridor are located from Miller Road to Jackrabbit Trail and from Litchfield Road to 75th Avenue, and all segments will operate at LOS A with 2005 projected traffic volumes.

3.4 2020 Projected ADT's

3.4.1 MC 85 2020 ADT's: The 2020 MAG ADT projections for MC 85 are summarized in Table 3.3 below. The highest volume locations are from Cotton Lane to Litchfield Road and from 99th Avenue to 75th Avenue.

TABLE 3.3
MC 85 2020 AVERAGE DAILY TRAFFIC (ADT)

Location	Average Daily Traffic(ADT)
SR 85 to Rooks Road	5,100
Rooks Road to Miller Road	4,700
Miller Road to Apache Road	8,900
Apache Road to Watson Road	15,000
Watson Road to Rainbow Road	16,100
Rainbow Road to Dean Road	13,600
Dean Road to Airport Road	11,200
Airport Road to Jackrabbit Trail	12,700
Jackrabbit Trail to Perryville Road	14,200
Perryville Road to Southern Avenue	14,400
Southern Avenue to Cotton Lane	14,000
Cotton Lane to Sarival Avenue	21,000
Sarival Avenue to Estrella Parkway	29,100
Estrella Parkway to Bullard Avenue	28,800
Bullard Avenue to Litchfield Road	30,200
Litchfield Road to Dysart Road	18,600
Dysart Road to El Mirage Road	16,800
El Mirage Road to 115th Avenue	15,800
115th Avenue to 107th Avenue	15,500
107th Avenue to 99th Avenue	19,700
99th Avenue to 91st Avenue	20,800
91st Avenue to 83rd Avenue	21,300
83rd Avenue to 75th Avenue	25,500

The City of Goodyear conducted their own traffic study. Both 2020 volumes and ultimate build-out conditions were analyzed. Table 3.4 summarizes the results of this study. The 2020 traffic volumes determined by the City are considerably higher than the MAG projections especially from Perryville Road to Cotton Lane. The build out volumes indicate the need for six lanes of through traffic.

TABLE 3.4
MC 85 GOODYEAR PROJECTED AVERAGE DAILY TRAFFIC (ADT)

Location	2020 Traffic (ADT)	Build out Traffic (ADT)
Perryville Road to Southern Avenue	25,000	35,000
Southern Avenue to Cotton Lane	25,000	35,000
Cotton Lane to Sarival Avenue	37,000	51,000
Sarival Avenue to Estrella Parkway	37,000	51,000
Estrella Parkway to Bullard Avenue	31,000	48,000
Bullard Avenue to Litchfield Road	31,000	48,000

3.4.2 Intersecting Roadways 2020 ADT's: The 2020 MAG ADT projections for the roadways intersecting MC 85 are summarized in Table 3.5 below. The highest volume locations are the north and south approaches of 75th Avenue, the north approach of Dysart Road and the west approach of Baseline Road. The traffic projections for Estrella Parkway at MC 85 seem to be underestimated based on current traffic and development activity. 2015 volumes from the Estrella Parkway Candidate Assessment Report indicate an ADT of 26,425 vehicles per day on Estrella Parkway south of MC 85 and 20,425 vehicles per day north of MC 85. A design value of 30,000 vehicles per day is currently being used to design improvements to Estrella Parkway.

TABLE 3.5
INTERSECTING ROADWAYS 2020 AVERAGE DAILY TRAFFIC (ADT)

Location	ADT (North)	ADT (South)
SR 85	8,700	12,100
Rooks Road	-	<1,000
Miller Road	7,300	<1,000
Baseline Road	16,000	-
Rainbow Road	8,800	-
Airport Road	2,100	1,600
Jackrabbit Trail	1,300	1,600

Perryville Road	4,000	-
Southern Avenue	4,000	-
Cotton Lane	11,100	7,900
Sarival Avenue	6,700	-
Estrella Parkway	6,700	9,200
Bullard Avenue	-	<1,000
Litchfield Road	17,000	12,700
Dysart Road	23,500	4,900
El Mirage Road	-	2,300
115th Avenue	12,300	9,700
107th Avenue	12,700	9,200
99th Avenue	12,300	6,300
91st Avenue	15,200	12,500
83rd Avenue	12,100	8,500
75th Avenue	20,900	18,400

3.5 Signal Warrant Analysis

3.5.1 2020 Projected ADT's: A signal warrant analysis was conducted at the major unsignalized intersections along the MC 85 corridor. Based on the 2020 traffic projections, the intersections of SR 85, Baseline Road, Rainbow Road, Cotton Lane, Sarival Avenue, Estrella Parkway, and Lower Buckeye Road will satisfy the criteria for signalization. A signal at Estrella Parkway is included in construction plans currently being developed.

3.5.2 2005 Projected ADT's: A signal warrant analysis was conducted at the major unsignalized intersections along the MC 85 corridor. Based on the 2005 traffic projections, the intersections of Estrella Parkway and Lower Buckeye Road will satisfy the criteria for signalization. A signal at Estrella Parkway is included in construction plans currently being developed.

Two other locations may also warrant consideration of traffic control by the year 2005, although projected volumes do not strictly meet the MCDOT volume criteria. These two locations are Baseline Road and Cotton Lane.

3.6 2020 Level of Service

3.6.1 Unsignalized Intersections: 15 unsignalized intersections along the MC 85 corridor were analyzed for level of service using 2020 traffic projections. Significant intersection delays are projected to occur during peak periods at Baseline Road, Rainbow Road, Cotton Lane, Sarival Avenue, Estrella Parkway, and Lower Buckeye Road. Each of these locations has been identified as warranting consideration of traffic signal control.

3.6.2 Signalized Intersections: 14 signalized intersections along the MC 85 corridor were analyzed for LOS using 2020 traffic projections. All of the signalized intersections will operate under capacity except for Dysart Road and 75th Avenue. The Dysart Road intersection can be improved to acceptable level of service by adding a westbound right turn lane with continuous "free flow" yield operation. The 75th Avenue intersection can be improved to an acceptable level of service by adding a westbound right turn lane and adding an additional northbound through lane

3.6.3 Multi-Lane Highway Segments: It is assumed that the entire corridor will be improved to 4 through lanes and left turn lanes before the year 2020. All MC 85 roadway segments will operate at a LOS of A except the segments from Estrella Parkway to Bullard Avenue, from Litchfield Road to Dysart Road, and from 83rd Avenue to 75th Avenue, which will operate at a LOS of B.

3.7 Transyt-7f Analyses

3.7.1 General: Transyt-7f is a traffic operations modeling software program that was developed in the United Kingdom, and was adapted for the Federal Highway Administration by the University of Florida Transportation Research Center. This software was used to model and analyze the project study corridor. Transyt-7f calculates measures of effectiveness (MOEs), which are traffic performance indicators. The MOEs include intersection delays, stops, total travel time, and queuing. The corridor was analyzed for the peak hour traffic conditions.

3.7.2 1997 Existing: The corridor was analyzed for the 1997 traffic volumes for the existing geometry, peak hour volumes (PHVs), and existing signal phasing. The results indicate there are no problems with mainline through traffic on MC 85. There are, however, a few movements on side streets with LOS E. These include the southbound through movements on

4th Street (Buckeye), Litchfield Road, and Dysart Road; northbound through movements on 111th Avenue and 75th Avenue; and left turn movements at Dysart Road and 111th Avenue (see Appendix O and Calculations Notebook). The total delay for the system is 8.1 seconds per vehicle, with 30 percent of the vehicles having to stop, and an average speed of 41.0 mph.

3.7.3 2020 No-Build: The existing corridor was analyzed for the existing geometry, projected 2020 PHVs, and existing signal phasing without any improvements. The mainline through traffic will still generally operate in an acceptable level of service in the 2020, however, some of the major intersections will experience operational problems (LOS of E or worse) during the peak hour including Estrella Parkway, Bullard Avenue, Lower Buckeye Road, Litchfield Road, Dysart Road, 111th Avenue, 99th Avenue, and 75th Avenue (see Appendix O and Calculations Notebook). The total delay for the system in the 2020 No-Build condition increases to 142.2 seconds per vehicle, while the system speed reduces to 11.7 mph and the percent stops increases to 38. This vehicle delay is 17.5 times greater than the delay per vehicle in 1997.

3.7.4 2020 Improvements: The improved corridor was analyzed for the proposed Medium Cost Alternative improvements, projected 2020 PHVs, and modified signal phasing. Signals were added at the seven new locations recommended in the traffic report. No problems were apparent on the mainline through traffic, and again, the intersections showed significant delay. Intersections experiencing LOS E or worse include 4th Street (Buckeye), Cotton Lane, Estrella Parkway, Litchfield Road, and 75th Avenue (see Appendix O and Calculations Notebook). The total system delay is reduced to 66.5 seconds per vehicle, but the percentage of vehicles stops increases to 45, and the average speed increases to 19.6 (mph). The system delay is less than one-half the total system delay for the 2020 No-Build condition.

The differences in delay and stops between the 2020 No-Build condition and the 2020 Build condition indicates how installing new signalization at seven intersections and adding left-turn protection on the MC 85 mainline will improve the overall operation of the system. If geometric and signalization improvements are implemented by the year 2020, the PM peak hour will still be more congested than it is today, but not to the degree that it would be if no improvements are made to MC 85. Improvements on the intersecting roadways will also reduce the system delay per vehicle and should be pursued when MC 85 is improved in the adjacent segment.

ATTACHMENT D

ACCESS CONTROL AND CORRIDOR IMPROVEMENTS STUDY, MC 85 75TH AVE TO TURNER RD

CHAPTER 3 TRAFFIC ANALYSIS

CHAPTER 3
TRAFFIC ANALYSIS

3.1 Existing Traffic

3.1.1 Daily Traffic Volumes

Figure 3-1 displays the available 24-hour ADT counts taken within one mile of MC-85 in 2002 or later. Sources include MCDOT (2004 counts where available; otherwise 2003), MAG (2003), the City of Avondale (2004), and the City of Phoenix (2002). The Phoenix 2002 counts are shown only where more recent counts are not available. In addition, DMJM Harris commissioned 24-hour counts at eight locations along MC-85 especially for this study in March 2005. The morning peak hour at most of these sites occurred between 6:00 and 9:00 AM and the afternoon peak between 3:00 and 6:00 PM.

Along MC-85, weekday traffic volume recorded by the counters in 2003 and 2004 generally declines from east to west, with the notable exception of a MCDOT count between Litchfield Road and Bullard Avenue that was substantially higher than the contemporary MAG count on the same portion of the route. The MAG, MCDOT and Avondale counts on MC-85 ranged from 18,000 vehicles at the east end of the corridor to 3,000 at the west end.

The DMJM Harris March 2005 counts are consistently higher than earlier counts conducted at approximately the same locations. The difference is 20% between 83rd and 91st Avenues, 11% to 43% between Sarival Avenue and Cotton Lane, and 43% between Liberty School Road and Airport Road. The 21,000 daily vehicles counted near 118th Avenue (between Avondale Boulevard and El Mirage Road) constitute the highest count in the entire corridor.

Among the cross roads on which counts were conducted near MC-85, the highest volumes were reported on 83rd Avenue (by MCDOT), Dysart Road and Litchfield Road. SR 85, Estrella Parkway and Jackrabbit Trail/Tuthill Road were the most heavily traveled cross streets west of the Phoenix Goodyear Airport.

3.1.2 Classification Counts

The March 2005 data collection effort also counted vehicles by classification at four locations along MC-85. On multi-lane portions of the highway, classification counts were taken in the curb lanes only; this may tend to overstate the proportion of heavy vehicles on the full width of the roadway. Table 3.1 shows the percentage distribution of daily traffic among automobiles (including pick-up trucks and vans), buses and recreational vehicles, commercial trucks, and motorcycles. Autos accounted for 81% to 89% of vehicles; another 9% to 17% consisted of commercial trucks. Buses, recreational vehicles and motorcycles constituted approximately 3% of motorized traffic at the east end of the corridor, and only 1% elsewhere.

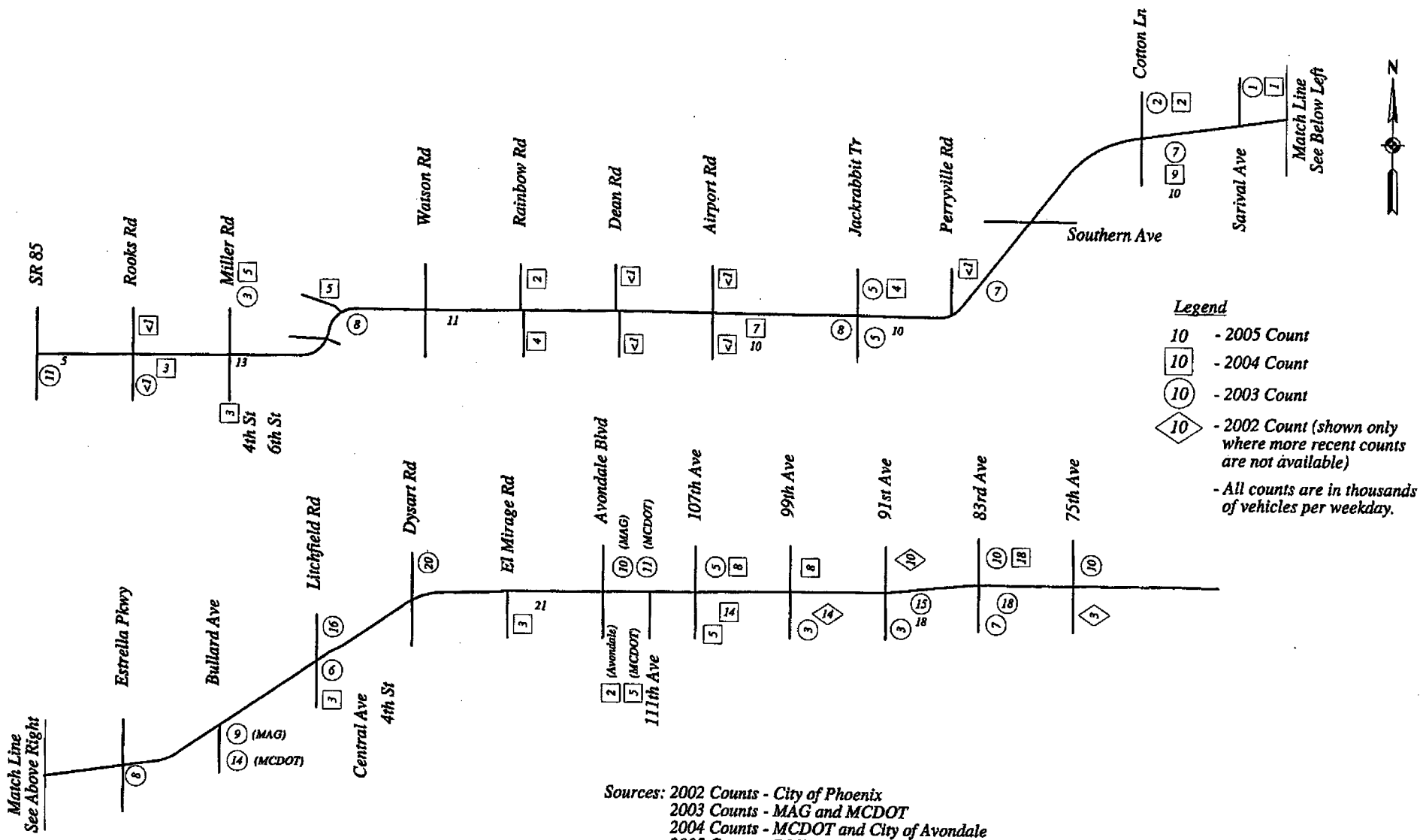


Figure 3–1

Existing Daily Traffic Volumes

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd

6/28/2006 H:\60436\PROD\TRA\EXIST ADT.DGN

Table 3.1: Distribution of Vehicles on MC-85 by Classification

Location	Percent of Total Vehicles			
	Automobiles	Commercial Trucks	Buses and RVs	Motorcycles
Near 87th Ave*	82%	16%	2%	1%
West of Perryville Rd	89%	9%	1%	0
West of Rainbow Rd*	85%	14%	1%	0
West of Rooks Rd	81%	17%	1%	0

*Eastbound and westbound curb lane only
Due to rounding, percents may not add precisely to 100.

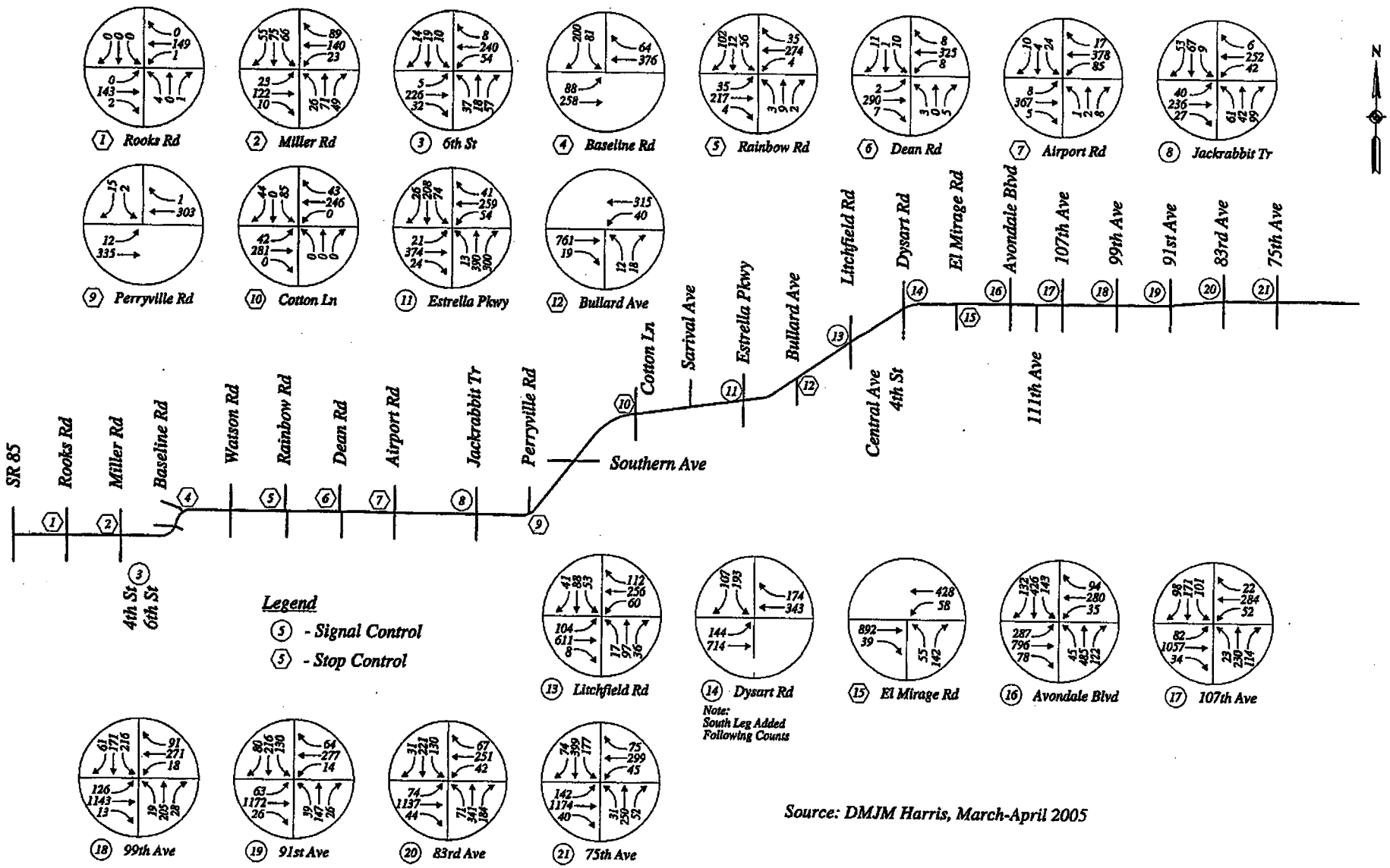
Source: DMJM Harris, March 2005

3.1.3 Peak Turning Movement Counts

Turning counts were taken on weekdays during the last week of March and the first week of April 2005 at 21 intersections along MC-85. The number of vehicles making each movement was totaled by 15-minute interval from 6:30 to 8:30 AM and from 3:30 to 5:30 PM. DMJM Harris used these counts to analyze existing intersection performance (level of service), as described in Section 3.3 below.

Figures 3-2 and 3-3 provide the raw turning movement numbers during the AM and PM peak hour at each intersection, within the timeframes when counts were conducted. Figures 3-4 and 3-5 show the distribution of entering volume in the AM and PM peak. Peak hour volumes at major intersections generally tend to decrease from the east end to the west end of the corridor. Entering volumes are higher in the PM than the AM peak at 17 of the 21 intersections. To the east of Estrella Parkway, east-west traffic on MC-85 has a strong directional skew, with eastbound traffic predominating in the AM peak and westbound traffic in the PM peak. This directional imbalance is consistent with peak period commute patterns in the greater Phoenix area. From Estrella Parkway west, this pattern dissipates, implying that this portion of MC-85 acts less as a commute route.

Table 3.2 shows how entering traffic at each intersection is distributed between MC-85 and the cross street during the AM and PM peaks. At 18 of the 21 intersections, 60% or more of the vehicles enter on MC-85 during both peak hours. The exceptions are Avondale Boulevard in Avondale, Estrella Parkway in Goodyear and Miller Road in Buckeye, where over 40% of peak hour vehicles enter from the north or south.

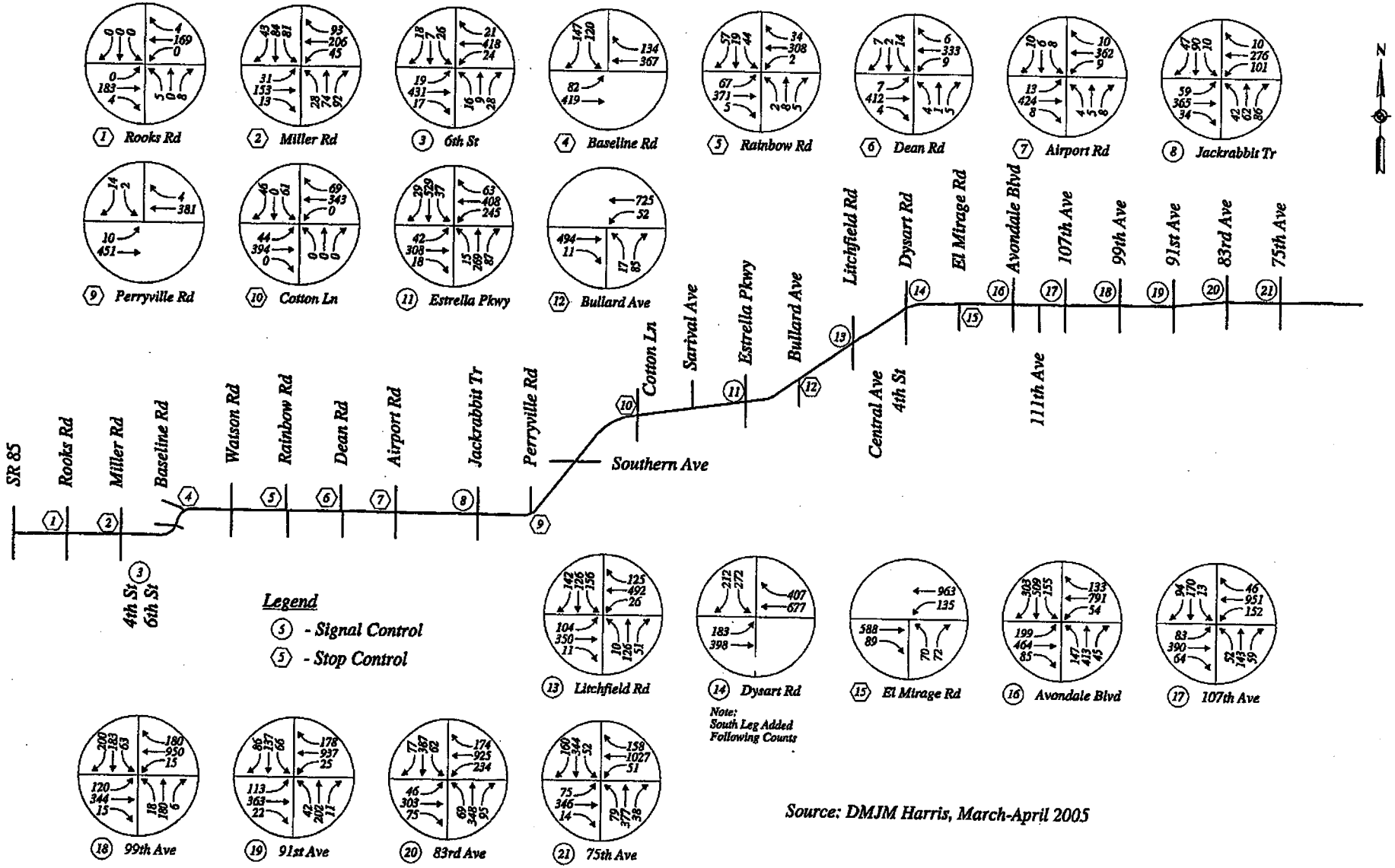


Source: DMJM Harris, March-April 2005

Figure 3–2

Existing AM Peak Hour Turning Volumes

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd



Source: DMJM Harris, March-April 2005

Figure 3-3

Existing PM Peak Hour Turning Volumes

Access Control and Corridor Improvement Study
MC-85, 75th Ave to Turner Rd

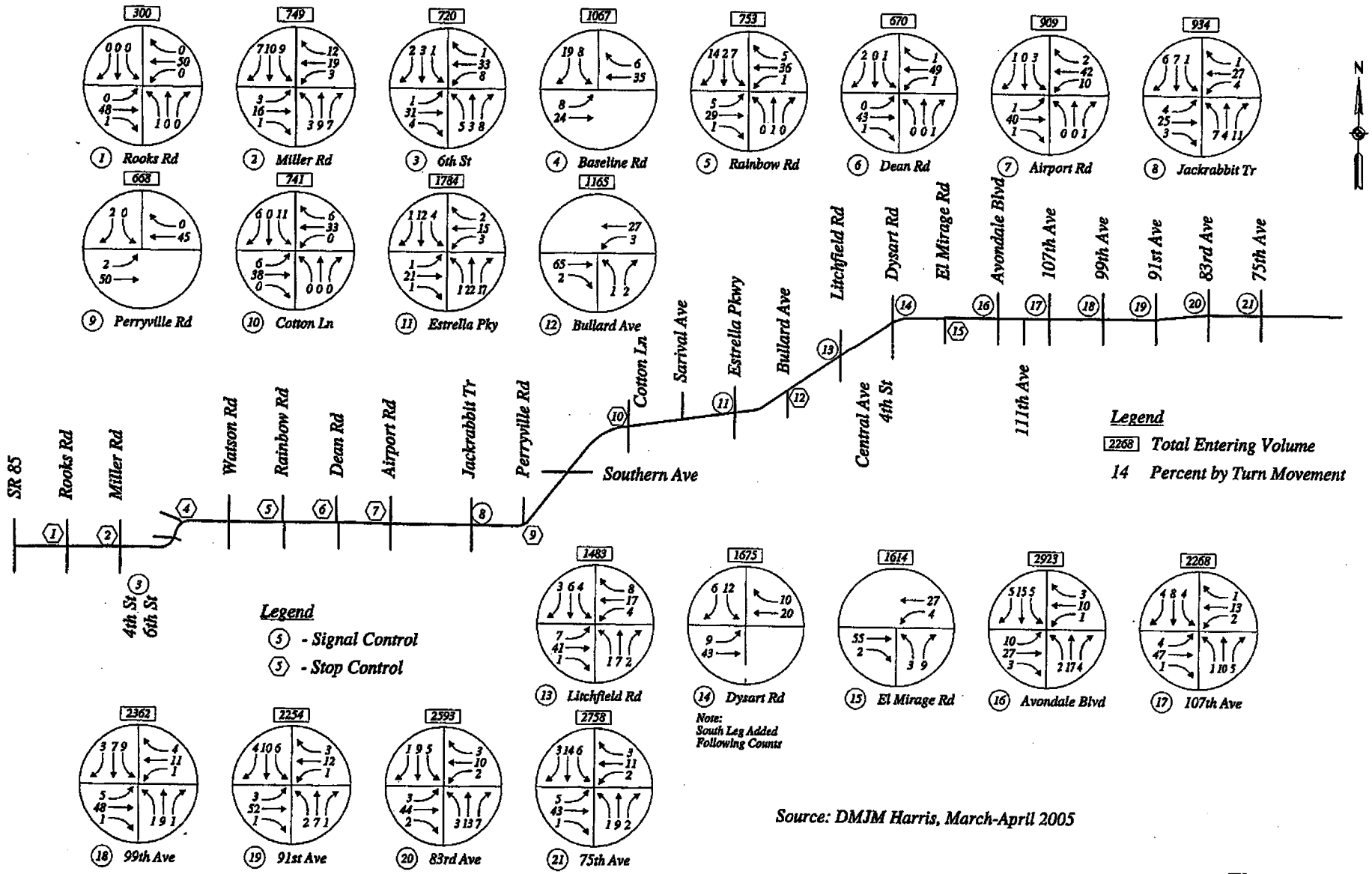
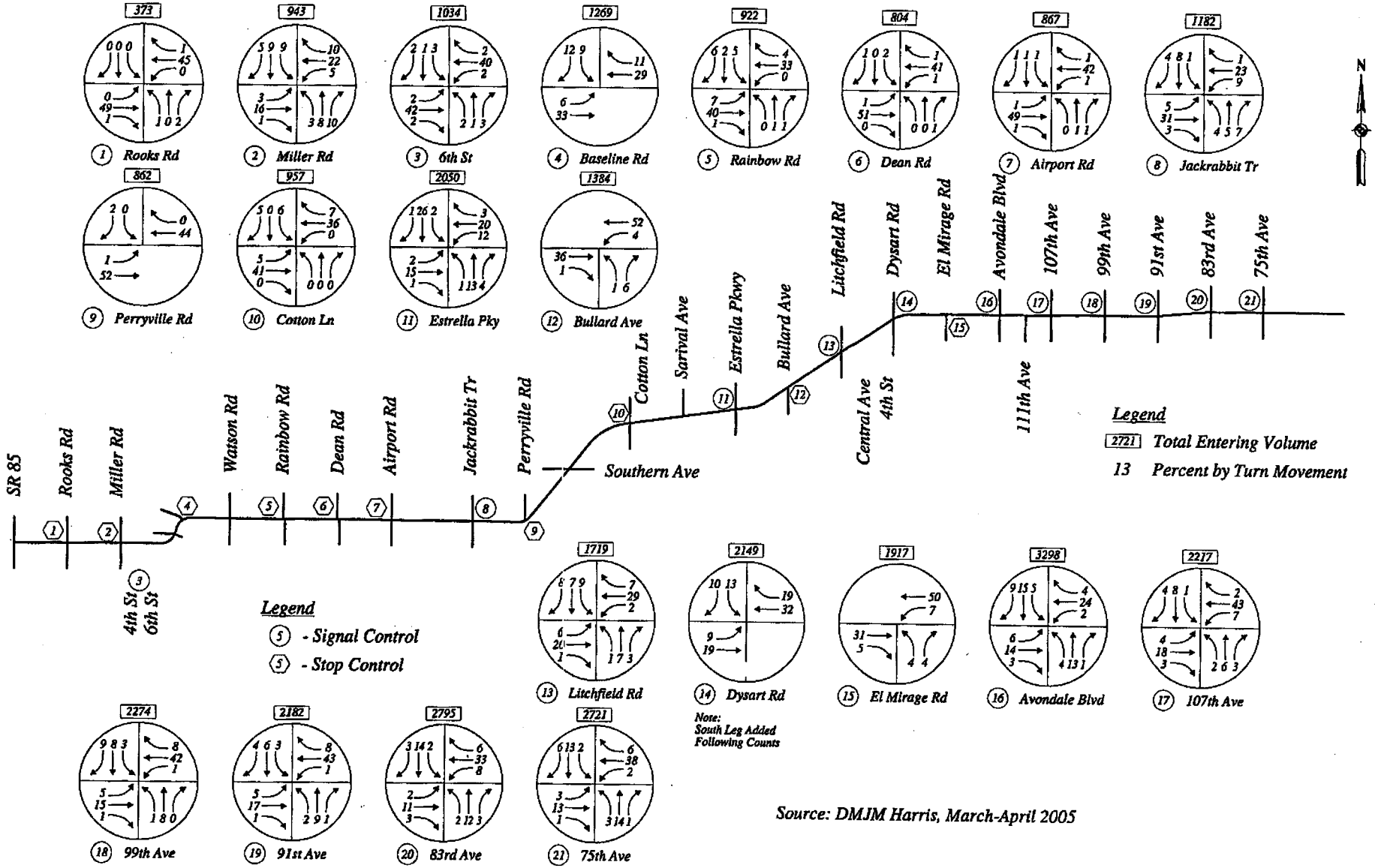


Figure 3–4

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd

Existing AM Peak Hour Turning Movement Distribution



Source: DMJM Harris, March-April 2005

Figure 3–5

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd

Existing PM Peak Hour Turning Movement Distribution

7/24/2005 N:\6436\PROD\TRA\EXST PM TURN DISTRIBUTION.DGN

Table 3.2: Peak Hour Distribution of Entering Traffic: MC-85 versus Cross Streets

Percent of Peak Hour Traffic Entering from MC-85	Intersections
75% or more	--91st Ave (PM) --107th Ave (PM) --El Mirage Rd (AM and PM) --Dysart Rd (AM and PM) --Litchfield Rd (AM) --Bullard Ave (AM and PM) --Cotton Ln (AM and PM) --Perryville Rd (AM and PM) --Airport Rd (AM and PM) --Dean Rd (AM and PM) --Rainbow Rd (AM and PM) --Baseline Rd (PM) --6th St (AM and PM) --Rooks Rd (AM and PM)
60% - 74%	--75th Ave (AM and PM) --83rd Ave (AM and PM) --91st Ave (AM) --99th Ave (AM and PM) --107th Ave (AM) --Litchfield Rd (PM) --Jackrabbit Trail (AM and PM) --Baseline Rd (AM)
50% - 59%	--Avondale Boulevard (AM and PM) --Estrella Parkway (PM) --Miller Rd (AM and PM)
40% - 49%	--Estrella Parkway (AM)

Source: DMJM Harris, March and April 2005

3.2 Projected Traffic

3.2.1 Interim Forecast Year 2015

The MC-85 study team used the latest available MAG regional socioeconomic projections and traffic forecasts to estimate segment ADT and peak hour turning volumes for two future years: the interim year 2015 and the study horizon year 2026. The MAG model generated directional ADT volumes on each one-mile segment of every arterial roadway in the study area. From these daily segment-level traffic volumes, the study team derived year 2015 AM and PM peak hour turning movement volumes at key intersections along MC-85. The mathematical derivation process made use of existing turn movement percentages and applied appropriate balancing factors to equalize entering and departing volumes at each intersection.

The following factors were used to estimate projected turning volumes:

- "D" (percent of peak hour through traffic occurring in the peak direction): 60% (0.6)
- "K" (percent of ADT occurring during the peak hour of traffic): 8% (0.08)

For the interim year 2015, the modeled roadway network is based on today's network, but includes improvements already incorporated in the MAG model for that year. It assumes that MC-85 will remain on its existing alignment with the current number of lanes, and that the SR 801 east-west freeway will not yet exist. The 2015 network does include the planned Cotton Lane connection across the Gila River.

Figure 3-6 shows projected 2015 average daily traffic on MC-85 and other major roadways throughout the study area. Figures 3-7 and 3-8 illustrate the projected AM and PM peak hour turning movements at major intersections along MC-85.

3.2.2 Study Horizon Year 2026

The study team used a similar process to estimate average daily traffic and peak hour turning movement volumes for the study horizon year 2026. In this case, however, MC-85 was assumed to have six through traffic lanes from 75th Avenue to Jackrabbit Trail, and four lanes from Jackrabbit Trail to MC-85. These lane configurations reflect the recommendations in subsequent chapters of this report. In addition, both the SR 303 and SR 801 freeways were assumed to be open to traffic by 2026. Moreover, from Perryville Road west to SR 85, MC-85 is assumed to have been realigned to a new corridor known as the "South Bypass," generally following the north bank of the Gila River, and then Beloat and Hazen Roads. (From Perryville Road to Turner Road, the existing MC-85 roadway would remain, most likely as a minor arterial maintained by local jurisdictions.) This proposed realignment is discussed in Chapters 7 through 11.

Given this future roadway network, Figure 3-9 shows projected 2026 average daily traffic on MC-85 and other major roadways throughout the study area. Table 3.3 compares today's ADTs along MC-85 with year 2026 forecasts. For Segments 4 through 7, 2026 volumes are shown for both the existing alignment and the proposed South Bypass. The forecast 2026 traffic volumes along existing MC-85 are generally much higher than today's volumes, especially east of Jackrabbit Trail where they often more than double in the next 20 years. Even along Segment 5, where the proposed South Bypass would partially replace the current facility, traffic growth on the existing facility is expected to be substantial.

Table 3.3: Existing and Projected Year 2026 Average Daily Traffic

Segment	Average Daily Traffic (thousands of vehicles)		
	Existing Condition	Year 2026	
		Existing MC-85	South Bypass
1: 75th-107th Ave	14-18	32-39	N/A
2: 107th Ave-Litchfield Rd	6-21	29-32	N/A
3: Litchfield Rd-Estrella Pkwy	9-14	21-34	N/A
4: Estrella Pkwy-Jackrabbit Trail	7-10	28-34	29
5: Jackrabbit Trail-Watson Rd	7-11	15-18	14-24
6: Watson Rd-Miller Rd	8-13	6-9	10-12
7: Miller Rd-Turner Rd	3-5	5-24*	11-12

*Volume along existing MC-85 alignment is highest from SR 85 to Turner Road, west of the point where South Bypass ends.
Source: DMJM Harris and MAG traffic model forecasts

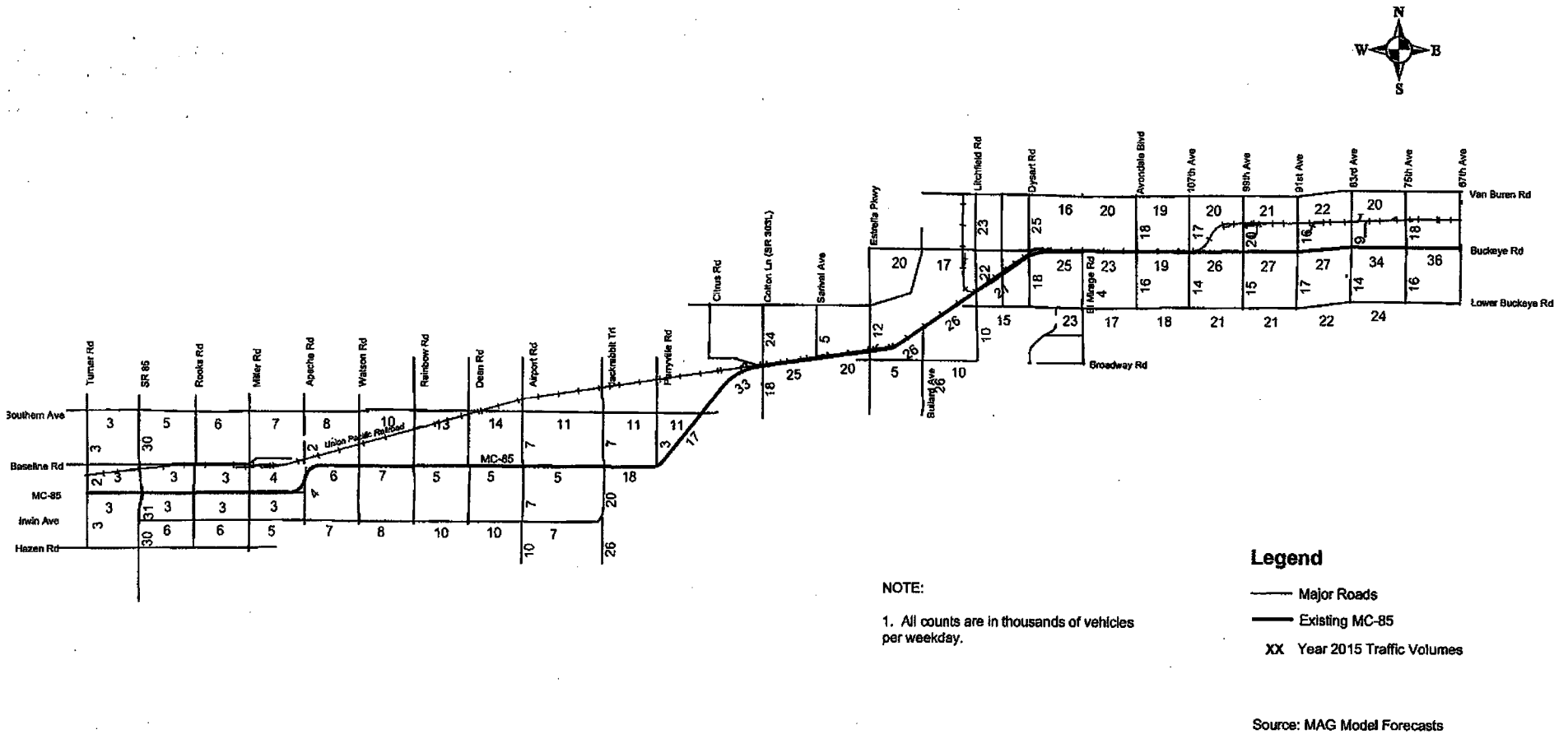
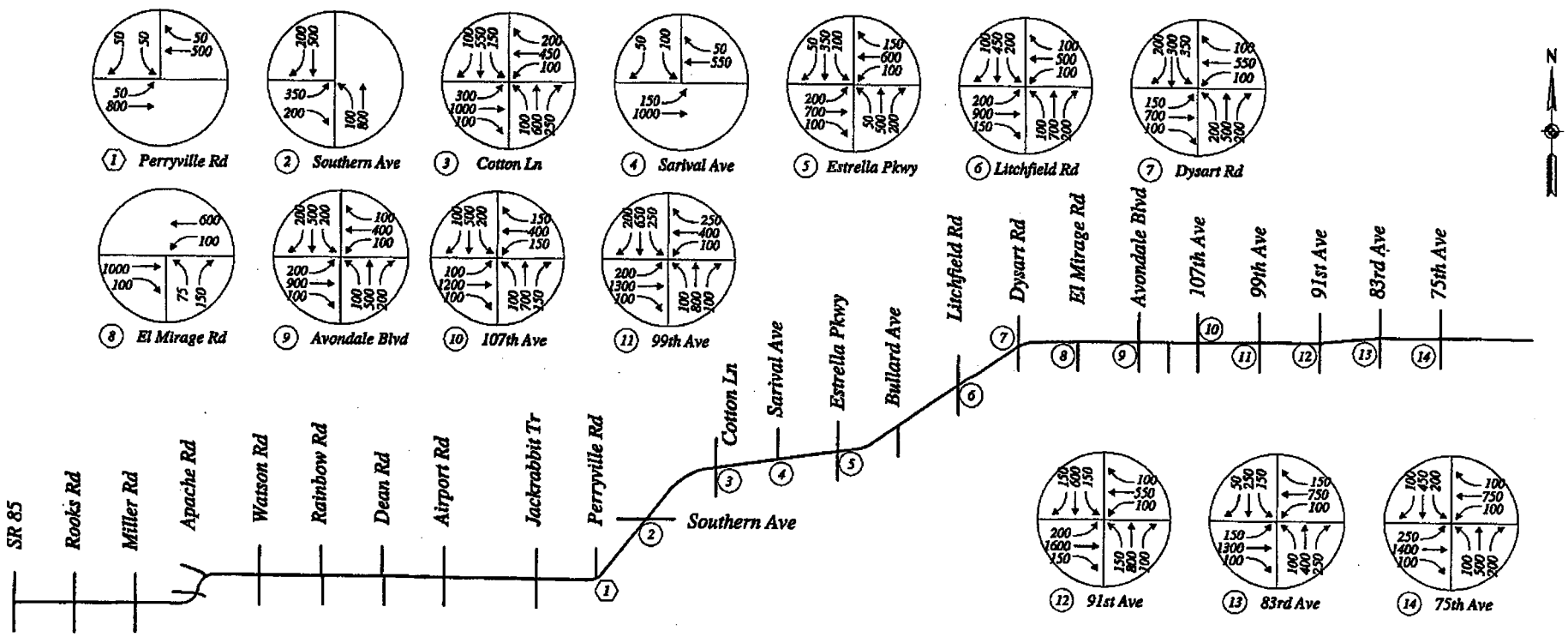


Figure 3-6

Access Control and Corridor Improvement Study
MC-85, 75th Ave to Turner Rd

Year 2015 Traffic Volumes



Legend

(5) - *Signal Control*

(5) - *Stop Control*

Note: Traffic projections not available for Bullard Avenue.

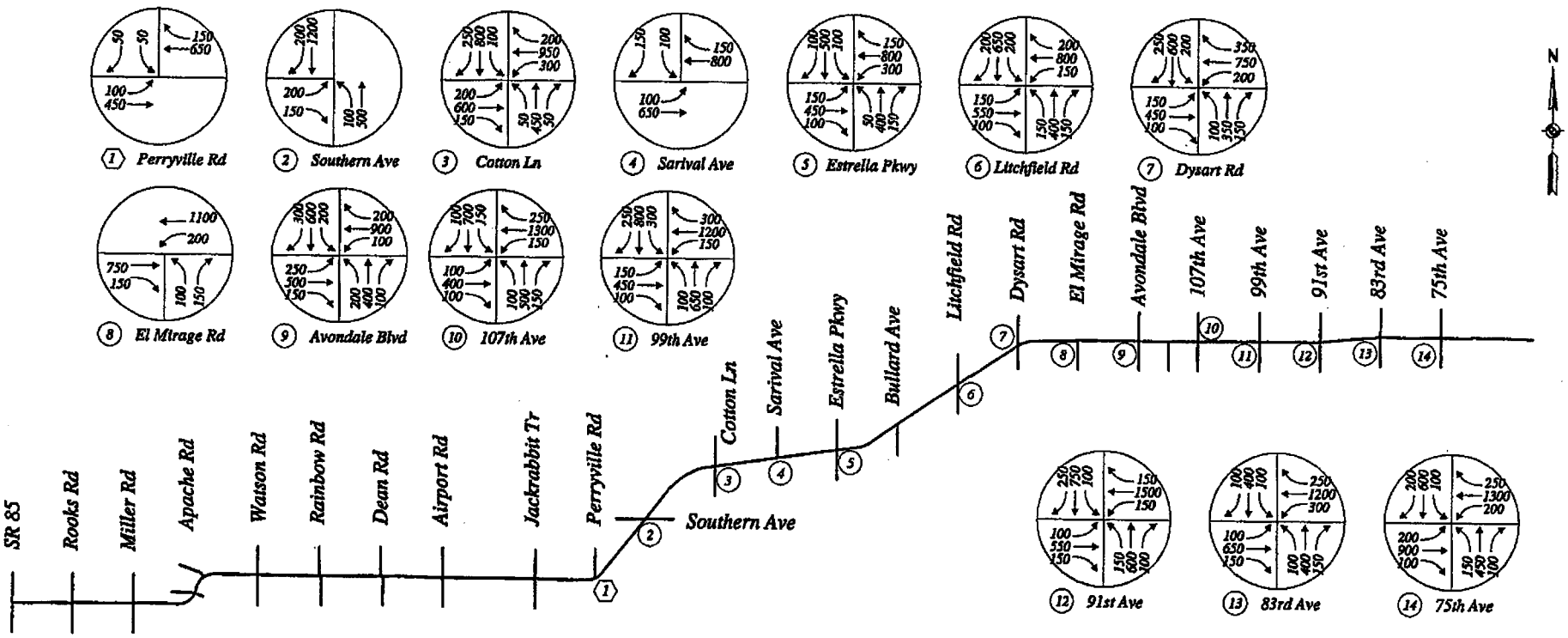
Source: DMJM Harris, June 2006

Figure 3–7

Year 2015 AM Peak Hour Turning Volumes

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd

8/9/2006 H:\6436\PROD\TRA\2015 AM TURN VOLUMES.DGN



Legend

(5) - *Signal Control*

(5) - *Stop Control*

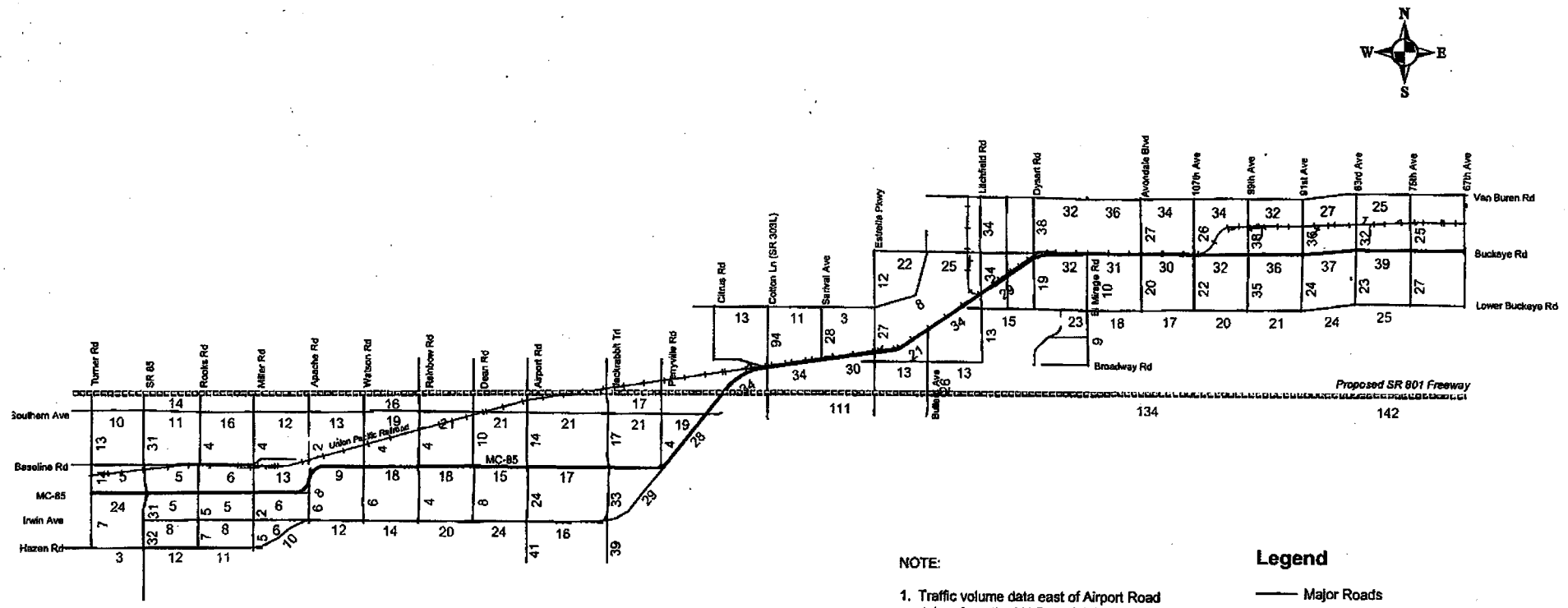
Note: Traffic projections not available for Bullard Avenue.

Source: DMJM Harris, June 2006

Figure 3–8

Access Control and Corridor Improvement Study MC–85, 75th Ave to Turner Rd

Year 2015 PM Peak Hour Turning Volumes



NOTE:

1. Traffic volume data east of Airport Road are taken from the MAG model that does not include the South Bypass.

2. Traffic volume data west of Airport Road are taken from the MAG model that includes the South Bypass.

3. All counts are in thousands of vehicles per weekday.

Legend

- Major Roads
- South Bypass
- Existing MC-85
- Proposed SR 801
- XX Year 2026 Traffic Volumes

Source: MAG Model Forecasts

Figure 3-9

Access Control and Corridor Improvement Study
MC-85, 75th Ave to Turner Rd

Year 2026 Traffic Volumes with South Bypass

Figure 3-10 depicts the proposed lane configuration at each major intersection along MC-85 in 2026. From Perryville Road west to SR 85, MC-85 is assumed to have been rerouted along the South Bypass alignment, resulting in a "T" intersection wherever a north-south roadway terminates. All the intersections in Figure 3-10 are expected to be signalized by 2026. Along MC-85 itself, exclusive right-turn lanes are anticipated at 75th and 83rd Avenues, 91st Avenue (eastbound only), 99th and 107th Avenues (westbound only), Avondale Boulevard (westbound only), El Mirage Road, Dysart and Litchfield Roads, Estrella Parkway, Sarival Avenue, Southern Avenue, Perryville Road, existing MC-85, and Dean, Rainbow, Watson, Apache, Miller and Rooks Roads. Dual left turn lanes are expected to be warranted westbound at 99th Avenue and Jackrabbit Trail, and also on several cross roads.

The projected AM and PM peak hour turning volumes are shown in Figures 3-11 and 3-12. All volumes are rounded to the nearest multiple of 50, except that volumes below 50 are reported as 50. The Cotton Lane intersection is omitted from Figures 3-10 through 3-12 because its future status is unclear, in view of the potential routing of the SR 303 freeway along the Cotton Lane alignment. The turning movement volumes in Figures 3-11 and 3-12 were used as inputs to calculate the year 2026 levels of service reported in Section 3.3 below.

3.2.3 Additional Future Traffic Issues

- The future alignment of the SR 303 freeway at its junction with MC-85 remains uncertain at this time. SR 303 could cross MC-85 either near Cotton Lane or farther west in the general vicinity of Perryville Road and Jackrabbit Trail. The absence of year 2026 turning movement projections for the MC-85/Cotton Lane intersection results from this uncertainty.
- The MAG socioeconomic projections used to generate the 2015 and 2026 traffic forecasts are much lower than the actual amount of planned and entitled development in West Valley, especially in the Town of Buckeye. MAG and the local jurisdictions are in the process of updating these projections to include the latest information. The revised projections were not completed in time for this study, but will be fully incorporated in such subsequent planning efforts as the Town of Buckeye General Plan Update and the MAG Interstate 10-Hassayampa Valley Roadway Framework Study. Meanwhile, because many of the available 2015 socioeconomic projections in the Buckeye area yield turning movement forecasts that are actually lower than today's counts, this report shows no 2015 turning movements or intersection levels of service west of Perryville Road.

3.3 Traffic Operational Analysis

3.3.1 Existing Conditions and Level of Service

As described in Section 2.13.2, the concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The six levels of service are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. In urban areas, the minimum acceptable LOS is usually considered to be D.

Table 3.4 shows the level of service criteria contained in the *Highway Capacity Manual* for signalized and unsignalized (STOP-controlled) intersections. "Intersection control delay" means delay due to the operation of intersection traffic control devices.

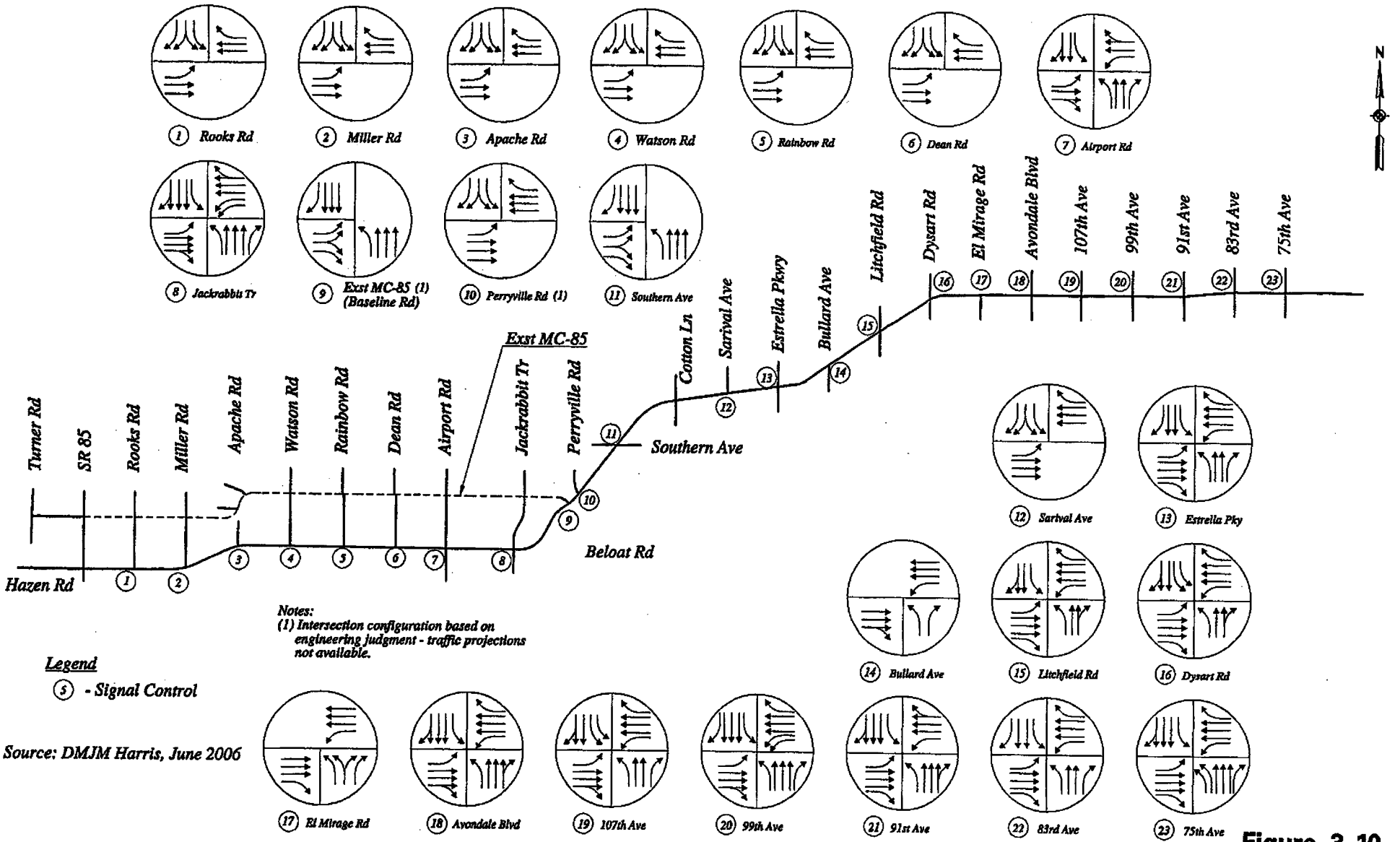
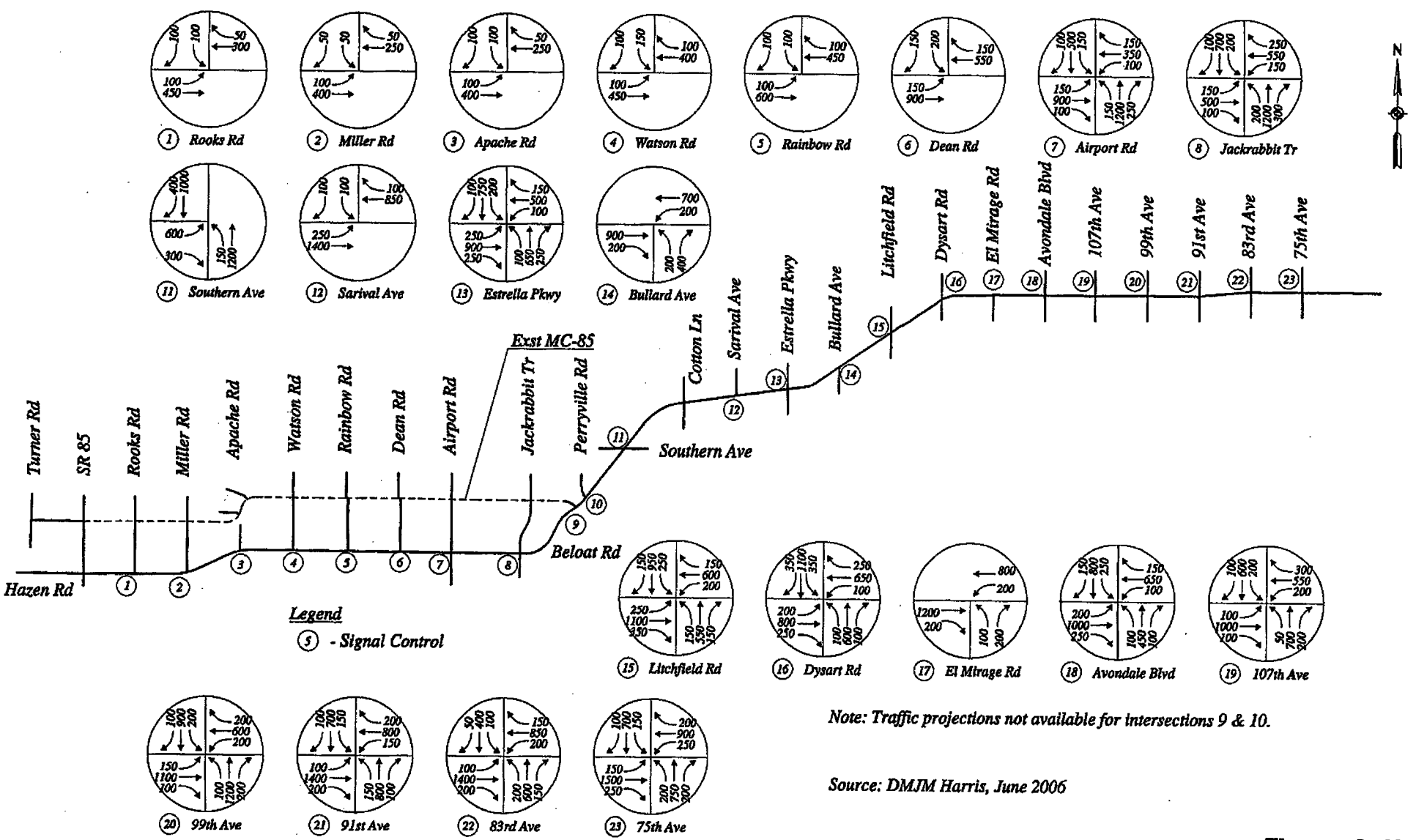


Figure 3–10

Projected 2026 Lane Configuration

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd

8/1/2006 N:\5436\PROG\TRA\2026 LANES.DGN



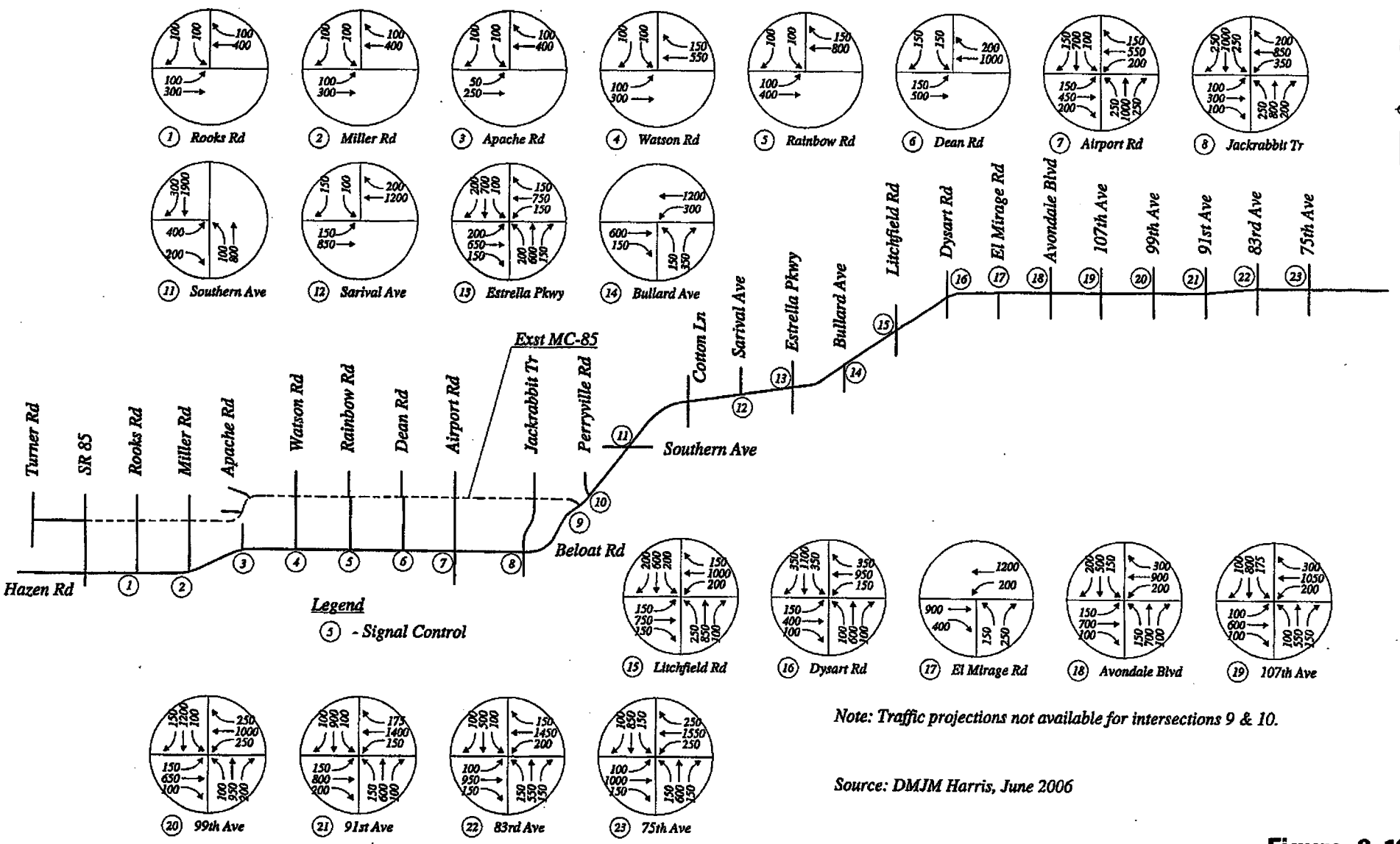
Note: Traffic projections not available for intersections 9 & 10.

Source: DMJM Harris, June 2006

Figure 3–11

Year 2026 AM Peak Hour Turning Volumes

Access Control and Corridor Improvement Study
MC–85, 75th Ave to Turner Rd



Note: Traffic projections not available for intersections 9 & 10.

Source: DMJM Harris, June 2006

Figure 3–12

Year 2026 PM Peak Hour Turning Volumes

Access Control and Corridor Improvement Study
MC-85, 75th Ave to Turner Rd

8/1/2006 H:\8436\PROGTRA\2026 PH TURN VOLUMES.DGN

Table 3.4: Intersection Control Delay

Level of Service	Signalized Intersection Control Delay (seconds/vehicle)	STOP-Controlled Intersection Control Delay (sec/veh)
A	< 10	< 10
B	10 – 20	10 – 15
C	20 – 35	15 – 25
D	35 – 55	25 – 35
E	55 – 80	35 – 50
F	> 80	> 50

Sources: Exhibits 16-2 and 17-2, 2000 *Highway Capacity Manual*

These criteria were applied to a capacity analysis of existing AM and PM peak hour conditions at 20 signalized and unsignalized intersections along MC-85. The following assumptions were used in the operational capacity analysis of both existing and future conditions:

- "T" (percent heavy trucks): 8% (0.08)
- Peak hour factor (the peak hour volume divided by (four times the volume occurring in the peak 15-minute period)): 90% (0.9)

Table 3.5 reports the results of the analysis. At signalized locations, the reported LOS represents an aggregate for the intersection as a whole. At STOP-controlled intersections, it is not possible to compute a composite level of service for the entire intersection, because through movements on the MC-85 mainline flow freely. Therefore, an individual LOS for each minor (STOP-controlled) approach and for left turns from MC-85 was calculated instead.

Table 3.5 indicates that an unacceptable LOS (E or F) currently occurs at only one of the analyzed intersections: MC-85/El Mirage Road. Here the estimated LOS for northbound traffic is E during the AM peak hour and F in the PM peak, with average delay exceeding 45 seconds in the morning and 90 seconds in the afternoon. It should be noted that these are minor movements at an unsignalized intersection that MCDOT has programmed for signalization.

Table 3.5: Existing 2005 Peak Hour Intersection Level of Service and Delay

Control	MC-85 Intersection	2005 LOS and Control Delay per Vehicle (seconds)	
		AM Peak Hour	PM Peak Hour
Signal	75th Ave	B (16.1)	B (16.3)
Signal	83rd Ave	B (18.8)	B (15.4)
Signal	91st Ave	A (7.7)	B (11.1)
Signal	99th Ave	A (9.5)	B (13.2)
Signal	107th Ave	B (11.0)	B (10.2)
Signal	Avondale Blvd	B (12.8)	C (20.8)
STOP	El Mirage Rd	**E (46.8)[1]**	**F (100.4)[1]**
		B (11.0)[4]	B (10.1)[4]
Signal	Dysart Rd*	A (9.7)	A (9.5)
Signal	Litchfield Rd	A (8.8)	A (9.4)
STOP	Bullard Ave	C (16.0)[1]	B (12.3)[1]
		A (10.0)[4]	A (8.8)[4]
Signal	Estrella Pkwy	A (7.9)	B (10.2)
STOP	Cotton Ln	C (18.4)[2]	C (23.8)[2]
		A (1.4)[3]	A (1.3)[3]
STOP	Perryville Rd	B (10.8)[2]	B (11.9)[2]
		A (8.1)[3]	A (8.3)[3]
Signal	Jackrabbit Trail	A (9.4)	B (11.2)
STOP	Airport Rd	B (11.9)[1]	C (15.1)[1]
		C (16.0)[2]	C (15.3)2
		A (0.4)[3]	A (0.6)3
		A (0.3)[4]	A (0.5)4

Table 3.5: Existing 2005 Peak Hour Intersection Level of Service and Delay (Cont)

Control	MC-85 Intersection	2005 LOS and Control Delay per Vehicle (seconds)	
		AM Peak Hour	PM Peak Hour
STOP	Dean Rd	B (10.8)[1]	B (12.5)[1]
		B (11.4)[2]	B (13.1)[2]
		A (0.2)[3]	A (0.5)[3]
		A (0.6)[4]	A (0.7)[4]
STOP	Rainbow Rd	C (15.2)[1]	C (17.8)[1]
		B (14.5)[2]	C (19.3)[2]
		A (2.2)[3]	A (2.7)[3]
		A (0.3)[4]	A (0.1)[4]
Signal	6th St	A (8.4)	A (9.5)
STOP	Miller Rd**	B (10.3)[1]	B (12.4)[1]
		B (11.1)[2]	B (13.2)[2]
		A (9.7)[3]	B (11.5)[3]
		B (11.1)[4]	C (15.2)[4]
STOP	Rooks Rd	B (10.6)[1]	B (10.3)[1]

*Conditions may have changed owing to the recent opening of a fourth (south) leg at this intersection.
**Traffic control has recently been changed from a two-way to a four-way STOP.

[1]Northbound traffic only
[2]Southbound traffic only
[3]Eastbound left turns only
[4]Westbound left turns only

Boldface denotes a level of service generally considered unacceptable.

Source: DMJM Harris, based on 2000 *Highway Capacity Manual* methodology.

3.3.2 Future Year Conditions and Level of Service

AM and PM peak hour intersection levels of service were estimated for future year 2015 and 2026 conditions, using the method described in Section 3.3.1. For the year 2015, major intersections along the existing MC-85 alignment were used (Figures 3-7 and 3-8); existing lane configurations were assumed to remain in place, except at the following locations where MCDOT has programmed improvements: 75th, 83rd, 91st, 99th and 107th Avenues, Estrella Parkway, Sarival Avenue, and Cotton Lane. For 2026, the study team used the existing MC-85 alignment from 75th Avenue to approximately Perryville Road, and the proposed South Bypass from that point to SR 85. The assumed intersection layouts are those shown in Figure 3-10.

Table 3.6 reports the resulting 2015 and 2026 peak hour intersection levels of service and average peak hour delay per entering vehicle. Existing (year 2005) signalized intersection data from Table 3.5 are also included for comparative purposes. In the year 2015, an unacceptable intersection LOS (E) is expected to occur only at the MC-85/Southern Avenue intersection, in both the AM and PM peak hours.

Table 3.6: Projected Year 2015 and 2026 Peak Hour Intersection Level of Service and Delay

MC-85 Intersection	LOS and Control Delay per Vehicle (seconds)					
	AM Peak Hour			PM Peak Hour		
	Existing	2015	2026	Existing	2015	2026
75th Ave	B (16.1)	C (21.0)	C (30.8)	B (16.3)	C (23.3)	C (25.3)
83rd Ave	B (18.8)	B (18.9)	C (24.7)	B (15.4)	B (18.2)	C (26.6)
91st Ave	A (7.7)	B (14.1)	B (16.5)	B (11.1)	B (14.2)	B (16.1)
99th Ave	A (9.5)	C (24.9)	C (28.1)	B (13.2)	C (22.9)	C (24.1)
107th Ave	B (11.0)	C (25.3)	C (25.0)	B (10.2)	C (23.8)	C (22.2)
Avondale Blvd	B (12.8)	C (27.5)	C (23.8)	C (20.8)	D (49.8)	C (22.4)
El Mirage Rd	*	B (13.7)	B (13.3)	*	B (14.1)	B (13.5)
Dysart Rd	A (9.7)	D (49.3)	C (32.7)	A (9.5)	B (17.6)	D (35.2)
Litchfield Rd	A (8.8)	D (43.9)	D (44.4)	A (9.4)	B (18.9)	C (34.9)
Bullard Ave	*	*	B (16.6)	*	*	A (8.7)
Estrella Pkwy	A (7.9)	A (8.2)	B (12.6)	B (10.2)	B (12.0)	B (14.8)
Sarival Ave	*	B (10.6)	B (12.3)	*	B (14.3)	B (13.1)
Cotton Ln	*	C (23.0)	**	*	C (31.0)	**
Southern Ave	*	**E (56.7)**	B (10.6)	*	**F (379)**	A (9.7)
Perryville Rd	*	*	A (6.2)	*	*	A (6.2)
Jackrabbit Trail	A (9.4)	*	C (23.4)	B (11.2)	*	C (31.4)
Airport Rd	*	*	D (46.6)	*	*	C (31.9)
Dean Rd	*	*	A (6.3)	*	*	A (6.8)
Rainbow Rd	*	*	A (5.5)	*	*	A (5.5)
Watson Rd	*	*	A (5.6)	*	*	A (5.4)
Apache Rd	*	*	A (8.8)	*	*	A (5.4)
Miller Rd	*	*	A (5.2)	*	*	A (5.4)
Rooks Rd	*	*	A (9.2)	*	*	A (5.4)

*No overall LOS available
**Not analyzed because of potential SR 303/MC-85 interchange at this location.
Boldface denotes a level of service generally considered unacceptable.

Source: MAG traffic model forecasts & DMJM Harris.

3.4 Signal Warrant Analysis

Signal warrant analyses were conducted in accordance with MCDOT Traffic Engineering Policy/Procedure Guideline (PPG), Section 4, Subject 4.6. This guideline sets forth the ADT volume warrant to be evaluated for future traffic needs on a new intersection, an intersection revised by a proposed roadway construction project, or at the driveway of a new commercial or residential development. The warrant is met when the estimated ADT on the major street and on the higher volume minor street or driveway approach to the intersection equals or exceeds the values in Table 3.7.

Table 3.7: ADT Volume Warrant

Lanes for Moving Traffic on Each Approach		Estimated ADT	
Major Street	Minor Street	Major Street	Minor Street
1	1	10,000	3,000
2 or more	1	12,000	3,000
2 or more	2 or more	12,000	4,000
1	2 or more	10,000	4,000
1	1	15,000	1,500
2 or more	1	18,000	1,500
2 or more	2 or more	18,000	2,000
1	2 or more	15,000	2,000

Source: MCDOT Traffic Engineering Policy/Procedure Guideline (PPG), Section 4, Subject 4.6

3.4.1 Signal Warrant Review

This project included a signal warrant review for intersections along MC-85. The signal warrants were evaluated based on traffic conditions expected in 2015 and 2026. The ADT volumes at the intersections are based on the traffic projections discussed earlier in this chapter.

Tables 3.8 and 3.9 show whether the warrants are expected to be met in 2015 and 2026, based on the traffic projections discussed earlier and on whether these projections exceed the minimum volumes shown in Table 3.7. Traffic signals will be installed at each intersection when MCDOT finds that the warrants have been met.

Table 3.8: Year 2015 Signal Warrant Review

Intersection	Existing Signal?	Traffic Lanes		Estimated ADT		Planning Warrant Met?
		Major Street	Minor Street	Major Street	Minor Street	
75th Ave	Yes	-	-	-	-	N/A
83rd Ave	Yes	-	-	-	-	N/A
91st Ave	Yes	-	-	-	-	N/A
99th Ave	Yes	-	-	-	-	N/A
107th Ave	Yes	-	-	-	-	N/A
Avondale Blvd	Yes	-	-	-	-	N/A
El Mirage Rd	No	2	1	> 18,000	> 3,000	Yes
Dysart Rd	Yes	-	-	-	-	N/A
Litchfield Rd	Yes	-	-	-	-	N/A
Bullard Ave	No	2	1	> 18,000	-	N/A
Estrella Pkwy	Yes	-	-	-	-	N/A
Sarival Ave	No	3	1	> 18,000	> 3,000	Yes
Cotton Ln	No	3	3	> 18,000	> 4,000	Yes
Southern Ave	No	1	1	> 15,000	> 3,000	Yes
Perryville Rd	No	1	1	> 15,000	< 1,500	No
Jackrabbit Tr	Yes	-	-	-	-	N/A
Airport Rd	No	-	-	-	-	N/A
Dean Rd	No	-	-	-	-	N/A
Rainbow Rd	No	-	-	-	-	N/A
Watson Rd	No	-	-	-	-	N/A
Apache Rd	No	-	-	-	-	N/A
Miller Rd	No	-	-	-	-	N/A
Rooks Rd	No	-	-	-	-	N/A

Sources: MCDOT PPG and DMJM Harris

Table 3.9: Year 2026 Signal Warrant Review

Intersection	Existing Signal?	Traffic Lanes		Estimated ADT		Planning Warrant Met?
		Major Street	Minor Street	Major Street	Minor Street	
75th Ave	Yes	-	-	-	-	N/A
83rd Ave	Yes	-	-	-	-	N/A
91st Ave	Yes	-	-	-	-	N/A
99th Ave	Yes	-	-	-	-	N/A
107th Ave	Yes	-	-	-	-	N/A
Avondale Blvd	Yes	-	-	-	-	N/A
El Mirage Rd	No	-	-	-	-	N/A
Dysart Rd	Yes	-	-	-	-	N/A
Litchfield Rd	Yes	-	-	-	-	N/A
Bullard Ave	No	-	-	-	-	N/A
Estrella Pkwy	Yes	-	-	-	-	N/A
Sarival Ave	No	-	-	-	-	N/A
Cotton Ln	No	-	-	-	-	N/A
Southern Ave	No	-	-	-	-	N/A
Perryville Rd	No	3	2	> 18,000	> 4,000	Yes
Jackrabbit Tr	Yes	-	-	-	-	N/A
Airport Rd	No	2	2	> 18,000	> 4,000	Yes
Dean Rd	No	2	2	> 18,000	> 4,000	Yes
Rainbow Rd	No	2	2	> 18,000	> 4,000	Yes
Watson Rd	No	2	2	> 12,000	> 4,000	Yes
Apache Rd	No	2	2	> 12,000	> 4,000	Yes
Miller Rd	No	2	2	> 12,000	> 4,000	Yes
Rooks Rd	No	2	2	> 12,000	> 4,000	Yes

Sources: MCDOT PPG and DMJM Harris

3.5 Recent Crash History

ADOT provided MCDOT with detailed information on 474 crashes (traffic accidents) reported along the MC-85 corridor during the three-year period beginning October 1, 2001 and ending September 30, 2004. It is important to note that at least one major gap exists in the ADOT data, so the list should not be viewed as all-inclusive. The ADOT records contain only two crashes at the busy MC-85/Dysart Road intersection in downtown Avondale—far fewer, for example, than the 39 reported at the Avondale Boulevard intersection or even the 18 reported at Litchfield Road over the same three years. The City of Avondale Police Department was able to supplement the ADOT data with limited information on 44 additional crashes that occurred at or near the MC-85/Dysart Road intersection from April 2003 through September 2004 only.

Table 3.10 presents the number of ADOT-reported crashes by manner of collision for each of the seven corridor segments. Multi-vehicle collisions were divided into eight categories: angle, head on, left turn/U-turn, rear end, sideswipe (same direction), sideswipe (opposite direction), pedalcyclist, and other (e.g., backing). The 76 single-vehicle collisions, representing 16% of the 474, consisted of two collisions with pedestrians, 41 crashes into fixed objects, 12 overturnings,

and 21 other incidents (e.g., collisions with parked vehicles and non-collision events such as vehicle breakage). No collisions with animals were reported.

The two most prevalent manners of collision were rear end and angle, together accounting for nearly half (48%) of the 474 crashes reported by ADOT. Left turns, U-turns and sideswipes accounted for another 30%. Single-vehicle incidents made up 21% of the crashes west of Litchfield Road but only 13% east of that point.

Table 3.11 uses a similar classification of collision types to show the distribution of injury versus non-injury crashes. In this table, crashes reported by ADOT as "Possible Injury" or "Unknown" were placed in the injury category. Under these assumptions, the 254 injury or possible injury accidents (including fatal collisions) represent 54% of the 474 ADOT-reported crashes in the corridor. Non-injury crashes exceeded known or possible injury crashes only in Segments 1 (Phoenix/Tolleson) and 6 (central Buckeye). The proportion of injury accidents was highest in Segments 2 and 3.

Comparison of Table 3.11 with Table 3.10 reveals that all of the head-on, pedestrian and pedalcyclist collisions resulted in one or more injuries, as did most of the overturnings. Of the three most common crash types (rear end, angle and left turn/U-turn), angle collisions were the most likely to cause injuries and rear-end collisions the least likely. Twelve of the additional 44 crashes in the Dysart Road vicinity reported by the City of Avondale caused injuries; data on the manner of collision is not available for these events.

Eight of the injury crashes resulted at least one fatality. These consisted of two crashes into fixed objects, one left turn and one U-turn collision, one head-on collision, one angle collision, one sideswipe, and one vehicle striking a cyclist. Five of the eight fatal crashes occurred within the approximately two-mile Avondale segment from 111th Avenue to the Agua Fria River.

Table 3.12 provides further information on the reported intersection or driveway relationship of the 474 ADOT-listed crashes by manner of collision. Some of the most common types of crash, especially angle and left turn/U-turn, occurred predominantly at intersections and driveways. On the other hand, none of the head-on crashes were intersection-related. Many of the sideswipes, pedestrian/cyclist collisions, crashes into fixed objects and overturnings were also unrelated to intersections or driveways.

Table 3.13 lists the locations within the corridor that experienced three or more crashes causing known injuries during the three-year analysis period. (Collisions involving "possible" or "unknown" injury are not included in this table.) Crashes within 0.1 miles of one another were considered to have occurred at the same location. The locations with the most injury crashes, as reported by ADOT or the City of Avondale, were 75th Avenue, 83rd Avenue, Avondale Boulevard and Dysart Road. The three-year total of injury accidents at Dysart Road may have been much larger than the 13 shown, as Avondale provided data only for the period beginning in April 2003. Estrella Parkway and Cotton Lane were the rural intersections with the most injury crashes.

Table 3.10: Reported MC-85 Motor Vehicle Crashes by Manner of Collision: October 1, 2001 through September 30, 2004

Segment	Number of Crashes											
	Angle	Head On	Left or U Turn	Rear End	Sideswipe (same direction)	Sideswipe (opposite direction)	Other Multi-Vehicle	Pedalcyclist/ Pedestrian	Single Vehicle/ Fixed Object	Over-turn	Other Single Vehicle	Total
75th-107th Ave[1]	28	1	33	51	13	1	10	3/0	8	6	5	159
107th Ave-Litchfield Rd[2, 3]	32	1	25	31	9	3	3	2/0	8	1	8	123
Litchfield Rd-Estrella Pky[4]	3	1	8	9	1	3	0	0/1	7	1	2	36
Estrella Pky-Jackrabbit Trail[5]	9	1	10	20	10	3	0	0/0	8	4	2	67
Jackrabbit Trail-Watson Rd[6]	6	1	2	7	3	0	1	0/1	9	0	0	30
Watson Rd-Miller Rd[7]	8	0	6	11	6	1	1	2/0	1	0	4	40
Miller Rd-SR 85[8]	10	1	3	2	3	0	0	0/0	0	0	0	19
Corridor Total	***96***	***6***	***87***	***131***	***45***	***11***	***15***	***7/2***	***41***	***12***	***21***	***474***

[1]Includes crashes at 107th Avenue intersection
[2]The City of Avondale provided dates and severity of 44 additional crashes that occurred in the MC-85/Dysart Road area from April 2003 through September 2004, but no data on the manner of collision; therefore, these crashes are not included here.
[3]Includes crashes at Litchfield Road intersection
[4]Includes crashes at Estrella Parkway intersection
[5]Includes crashes at Jackrabbit Trail intersection
[6]Includes crashes at Watson Road intersection
[7]Includes crashes at Miller Road intersection
[8]Includes crashes at SR 85 intersection

Source: Arizona Department of Transportation, 2004

Table 3.11: Reported MC-85 Injury Crashes by Manner of Collision: October 1, 2001 through September 30, 2004

Segment	Number of Crashes										
		Crashes Causing Known or Possible Injuries									
	Non-Injury	Angle	Head On	Left or U-Turn	Rear End	Sideswipe	Pedestrian or Pedalcyclist	Collision with Fixed Object	Overturn	Other (Single or Multi-Vehicle)	Total Injury Crashes
75th-107th Ave	80	19	1	15	23	5	3*	3	5	5	79
107th Ave-Litchfield Rd	51	24*	1*	14*	13	8*	2	4*	1	5	72
Litchfield Rd-Estrella Pky^	12	3	1	4	5	3	1	5	1	1	24
Estrella Pky-Jackrabbit Trail	31	5	1	8	9	6	0	3*	3	1	36
Jackrabbit Trail-Watson Rd	14	2	1	1	6	1	1	4	0	0	16
Watson Rd-Miller Rd	23	3	0	3	5	2	2	1	0	1	17
Miller Rd-SR 85	9	7	1	1*	0	1	0	0	0	0	10
Corridor Total	***220***	***63***	***6***	***46***	***61***	***26***	***9***	***20***	***10***	***13***	***254***

*Includes one fatal crash

^The City of Avondale provided information on the severity of 44 additional crashes that occurred in the MC-85/Dysart Road area from April 2003 through September 2004. Of these, 12 were reported as injury crashes and none as fatal. Data on the manner of collision are not available; therefore, these crashes are not included here.

Source: Arizona Department of Transportation, 2004

Table 3.12: Reported MC-85 Crashes by Intersection or Driveway Relationship: October 1, 2001 through September 30, 2004

Intersection or Driveway Relationship	Number of Crashes*									
	Angle	Head On	Left or U Turn	Rear End	Sideswipe	Pedestrian or Pedalcyclist	Collision with Fixed Object	Overturn	Other	Total
Intersection	86	0	66	87	24	2	16	1	21	303
Driveway	8	0	6	6	3	2	1	0	0	26
No Relationship	2	6	15	38	29	5	24	11	15	145
Corridor Total	***96***	***6***	***87***	***131***	***56***	***9***	***41***	***12***	***36***	***474***

*Does not include the 44 additional crashes in the MC-85/Dysart Road area reported by the Avondale Police Department.

Source: Arizona Department of Transportation, 2004

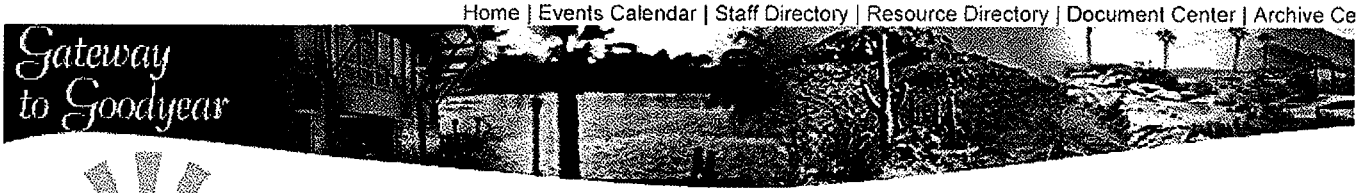
Table 3.13: Locations with Three or More Crashes Causing Known Injuries, 10/1/01-9/30/04

Location	Injury Crashes	Types	Notes
75th Ave	14	Angle (6) Left Turn (2) Pedalcyclist (2) Rear End (3) Struck Traffic Signal (1)	Includes one fatal crash involving a pedalcyclist
83rd Ave	9	Angle (4) Left Turn (3) U-turn (1) Struck Traffic Signal (1)	None
91st Ave	3	Angle (2) Rear End (1)	None
99th Ave	6	Left Turn (5) Angle (1)	None
107th Ave	5	Angle (4) Left Turn (1)	None
111th Ave	3	Left Turn (1) Head On (1) Rear End (1)	Includes a fatal head-on crash not listed as intersection-related, although less than 0.02 miles west
Avondale Blvd	15	Angle (8) Left Turn (6) Struck Traffic Signal (1)	Includes two fatal crashes (one angle, one left turn)
El Mirage Rd	4	Angle (2) Rear End (1) Sideswipe Same (1)	Two fatal crashes occurred within 0.5 miles west of intersection: one sideswipe opposite, one single vehicle
Dysart Rd*	13	Not available, except for one rear end crash	Twelve of these crashes occurred from April 2003 through September 2004; more may have occurred earlier
Litchfield Rd	5	Angle (3) Left Turn (1) Rear End (1)	None
Estrella Pkwy	6	Left Turn (3) Angle (1) Rear End (1) Sideswipe Same (1)	None
Cotton Ln	7	Rear End (3) Angle (3) Left Turn (1)	None
"Monroe/Main St"	5	Left Turn (2) Rear End (2) Pedalcyclist (1)	Location isn't clear; no "Main St" intersects MC-85 in Buckeye
Miller Rd	4	Angle (4)	None

Sources: Arizona Department of Transportation (2004); *City of Avondale Police Department (2005)

ATTACHMENT E

CITY OF GOODYEAR POPULATION



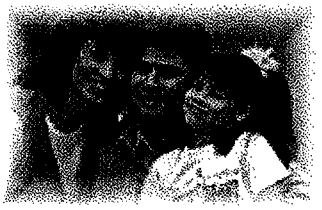
"Protector of Luke Air Force Base's Southern Departure Corridor"

About Goodyear

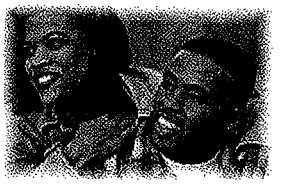
Population/Demographics – We're a Growing Communit

Development in the Phoenix area is moving west! Since 1998, more than 50% of the Valley building permits have been in the West Valley with the Southwest Valley leading the development boom. Goodyear is setting the pace among West Valley cities. Goodyear is the fifth fastest growing city in the Phoenix metro area between 2000 and 2005, averaging 16% growth per year for the past seven years.

With a mere 2,747 residents in 1980 and 6,258 in 1990, Goodyear's population has exploded to more than 56,000 people in 2007. By 2020, it is expected to surge to 162,623 and then more than double to 334,652 by 2030.



Goodyear has a diverse population with more than 81 percent of heads of households being college-educated and 49 percent having college degrees.



As of the 2000 Census, the median income of our residents was $57,492 – one of the highest in the state and higher than that of the metro area's four largest cities: Phoenix, Mesa, Glendale and Scottsdale.

As of 2007, the estimated median household income is $72,200.

Top

Last Updated: 1/10/2008

ATTACHMENT F

FHWA GRADE SEPARATION GUIDELINES TABLE AND SUPPORT CALCULATIONS

FHWA - GRADE SEPARATION GUIDELINES

Highway-rail grade crossings should be considered for grade separation or **otherwise eliminated across the railroad right of way whenever one or more of the following conditions exist:**

		Crossing 1	Crossing 2	Crossing 3	Crossing 4	Crossing 5	Crossing 6
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	No See Calc Attachment F					
	Crossing meets the criteria by 2030	No See Calc Attachment F					
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria	No See Calc Attachment F					
	Crossing meets the criteria by 2030	No See Calc Attachment F					
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	No					
	Crossing meets the criteria by 2030	No					

Sarival Ave Crossing
UPRR Crossing No. 741782L

Collision Factors

Factors for Collision Prediction Calculations:

Parameters	Formula/Value	Description	Taken From
K=		Formula Constant	Table 16
c=		Annual # of highway vehicle per day	Design
t=		Annual average of trains per day	Design
MT=	e^(0.2912 x mt)		Calculated
mt=	1	Number of main tracks	
DT=	1	Factor of number of through train per day during daylight	Table 16
HP=	1	Highway paved	Table 19
MS=	1	Maximum timetable speed	Table 16
HT=	1	highway type factor value	Table 16
HL=	e^(0.1036(hl-1))		Calculated
hl=		Number of highway lanes	Design

Note:
All factors and reference to tables are based on information shown at:
Railroad-Highway Grade Crossing Handbook, Section 3: Assessment of Crossing Safety and Operation
Online Link: http://safety.fhwa.dot.gov/xings/07010/sec03.htm

Sarival Ave Crossing
UPRR Crossing No. 741782L

Accident Prediction

With Gate Device	Meet Criteria	Final Accident Prediction	Historical Number of Accident in 5 Years (N/T)	Initial Collision Prediction (a)
Formula	Criteria >0.5?	From Table 20 (Determined by "a" and "N/T")	(N-Number of actual accidents over T-number of years)	a= K*EI*MT*DT*HP*MS*HT*HL
Year 2006	**Not Met**	**0.035**	0	0.03788
Year 2027	**Not Met**	**0.062**	0	0.06887

Parameters	Formula Constant (K)	Exposure Index Factor (EI)	Main Tracks Factor (MT)	Day Thru Trains Factor (DT)	Highway Paved Factor (HP)	Maximum Speed Factor (MS)	Highway Type Factor (HT)	Highway Lanes Factor (HL)
Formula	Constant taken from Table 16	From Table 19 Determined by c*t	e^(0.2912mt)	1.00	1.00	1.00	1.00	e^0.1036(hl-1)
Year 2006	0.001088	23.46	1.34	1.00	1.00	1.00	1.00	1.11
Year 2030	0.001088	34.67	1.34	1.00	1.00	1.00	1.00	1.36

Data	AADT (c)	Total Train Movements Per Day (t)	Number of Main Track (mt)	Number of Highway Lanes (hl)
Year 2006	1656	3	1	2
Year 2030	6099	3	1	4

Sarival Ave Crossing
UPRR Crossing No. 741782L

Delay

Train in Movement Condition

Year	Meet Criteria (>40)?	Total Delay (veh*hours)	Train Passage Time (sec)	Gate Movement Time (sec)	Traffic Rate (veh/sec)	AADT	Train Length (ft)	Road Width (ft)	Train Speed (MPH)	No. of Daily Thru Train
2006	**Not Met**	**1.266**	246.55	35	0.02	1656	9000	40	25	3
2030	**Not Met**	**4.699**	247.64	35	0.07	6099	9000	80	25	3

Train Passage Time: (length of train+roadway width)x(3600)/5280xspeed)
Gate Movement Time: (Taken from "Preemption of Traffic Signals Near a Railroad Crossing", page 12)
Total Delay: [number of trains x{(traffic rate)x(train passage time+gate movement time)^2/(3600)}]
No. of Trains: Based on e-mail from Steve Newman (UPRR) on July 16, 2008.

Stopped Train Condition

Year	Meet Criteria (>40)?	Total Delay (veh*hours)	Train Stopped Time (sec)	Gate Movement Time (sec)	Traffic Rate (veh/sec)	AADT	Train Length (ft)	Road Width (ft)	Train Speed (MPH)	No. of Daily Thru Train
2006	**Not Met**	**6.440**	600.00	35	0.02	1656	9000	40	25	3
2030	**Not Met**	**23.720**	600.00	35	0.07	6099	9000	80	25	3

Based on field observations, trains were stopped at the crossing for a duration of less than 10 min.
Ten minutes were used to calculate the stopped Condition Delay as shown in the table above.

Crossing Exposure

Crossing exposure:Trains per day x AADT

Trains Per Day	3	
2006 AADT	1656	
2030 AADT	6099	
2006 Exposure	4968	<1M - Does Not Meet Criteria
2030 Exposure	18297	<1M - Does Not Meet Criteria

01

IN THE MATTER OF THE APPLICATION OF THE MARICOA COUNTY DEPARTMENT OF TRANSPORTATION TO UPGRADE A CROSSING OF THE UNION PACIFIC RAILROAD AT SARIVAL AVENUE IN MARICOPA COUNTY, ARIZONA.
AAR/DOT NO. 741-782-L.
(DOCKET NO. 03639A-08-0311)

On June 11, 2008, the Maricopa County Department of Transportation ("MCDOT") filed with the Arizona Corporation Commission ("Commission") an application for approval for the Union Pacific Railroad ("Railroad") to upgrade an existing crossing at Sarival Avenue in Maricopa County, Arizona at AAR/DOT No. 741-782-L.

The application is available for inspection during regular business hours at the offices of the Commission in Phoenix, at 1200 West Washington Street, Phoenix, Arizona, and on the internet via the Commission website (www.azcc.gov) using the e-docket function.

The Commission will hold a hearing on this matter commencing on August 28, 2008, at 10:00 a.m., at the Commission's offices, 1200 West Washington Street, Phoenix, Arizona. Public comments will be taken on the first day of the hearing.

The law provides for an open public hearing at which, under appropriate circumstances, interested parties may intervene. Intervention shall be permitted to any person entitled by law to intervene and having a direct and substantial interest in the matter. Persons desiring to intervene must file a written motion to intervene with the Commission, which motion should be sent to Applicant or its counsel and to all parties of record, and which, at the minimum, shall contain the following:

1. The name, address and telephone number of the proposed intervener and of any party upon whom service of documents is to be made if different than the intervener.
2. A short statement of the proposed intervener's in the proceeding (e.g., a customer of Railroad, a neighboring property owner, a crossing user, etc.).
3. A statement certifying that a copy of the motion to intervene has been mailed to the Applicant or its counsel and to all parties of record in the case.

The granting of motions to intervene shall be governed by A.A.C. R14-3-105, except that all motions to intervene must be filed on or before August 8, 2008. The granting of intervention, among other things, entitles a party to present sworn evidence at hearing and to cross-examine other witnesses. However, failure to intervene will not preclude any customer from appearing at the hearing and making a statement on such customer's own behalf.

If you have any questions about this application, you may contact the applicant at 602-506-8992. If you wish to file written comments on the application or want further information on intervention, you may write the Consumer Services Section of the Commission at 1200 West Washington Street, Phoenix, Arizona 85007 or call 1-800-222-7000 or appear at the hearing and make comment.

The Commission does not discriminate on the basis of disability in admission to its public meetings. Persons with a disability may request a reasonable accommodation such as a sign language interpreter, as well as request this document in an alternative format, by contacting Linda Hogan, ADA Coordinator, voice phone number (602) 422-3931, E-mail lhogan@azcc.gov. Requests should be made as early as possible to allow time to arrange the accommodation.

Published: July 24, 2008

Arizona Business Gazette
The business resource

PO BOX 194
Phoenix, Arizona 85001-0194
(602) 444-7315 FAX (602) 444-7364

STATE OF ARIZONA
COUNTY OF MARICOPA } SS.

Ed Carlise, being first duly sworn, upon oath deposes and says: That of the Arizona Business Gazette, a newspaper of general circulation in the county of Maricopa, State of Arizona, published weekly at Phoenix, Arizona, and that the copy hereto attached is a true copy of the advertisement published in the said paper on the dates indicated.

7/24/2008

Sworn to before me this
22ND day of
AUGUST 2008

Mark Gilmore
Notary Public
Maricopa County, Arizona
My Comm. Expires 08-04-11

Notary Public

EXHIBIT
A-4
ADMITTED

A. Signature
X Marvin Demers
☐ Agent
☐ Addressee

B. Received by (Printed Name) Date of Delivery
PAUL 21 2004

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

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2. Article Number (Transfer from service label) 7007 2680 0002 9601 5937

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1. Article Addressed to:
Janice Alward - ACC
1200 W. Washington St.
Phoenix, Az 85007

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1. Article Addressed to:
John Syers
Railroad Engineering
Coordinator ADOT
205 S. 17th Ave. M/D 618E
Phoenix, Az 85007

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by (Printed Name) JUL 21 2004 C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

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☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5753

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-

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1. Article Addressed to:
David Ramirez
City of Goodyear
195 N. 145th Ave., Bld D
Goodyear, Az 85338

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by (Printed Name) Josh Berry C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5760

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Brian Lehman - ACC
1200 W. Washington St.
Phoenix, Az 85007

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Marvin Demers
☐ Agent
☐ Addressee

B. Received by (Printed Name) JUL 21 2004 C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
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4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5944

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Smith & Smith Land Company
510 N. Old Litchfield Rd.
Litchfield Park, Az
85340

A. Signature
X [signature] ☐ Ag ☐ Ad

B. Received by (Printed Name) | C. Date of [illegible] 7/19/

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

Same

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merch
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5784

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1. Article Addressed to:

Bay-Herin Group TR
3224 E. Camelback Ste 130
Phoenix AZ 85016

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Age ☐ Add

B. Received by (Printed Name) Mike Ryan | C. Date of D 7/21/0

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merch
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5845

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Material Delivery, Inc
2815 E Rose Garden Ln
Phoenix, Az 85050

A. Signature
X Rachel Beadle ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery 7/19/0

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandis
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5814

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Sami Ayoub
2901 W. Durango St.
Phoenix Az 85009

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Age ☐ Addressee

B. Received by (Printed Name) Charles T. Tusch | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

JUL 22 2009

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merch
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5975

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1. Article Addressed to:

T
NOTIFY SENDER OF NEW ADDRESS
RUSSELL AD DEVELOPMENT
PO BOX 28216
SCOTTSDALE AZ 85255-0153

BC: 85255015316 *1614-17572-10-41

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Age ☐ Add

B. Received by (Printed Name) JANET STEWART | C. Date of D 7/22/09

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merch
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5821

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

WR Meadows of Az, Inc.
PO Box 338
Hampshire, IL 60140

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) John S. Derderian C. Date of Delivery 7-21-

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☒ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5791

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

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- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Az. Reporting Services Inc.
2200 N. Central St.
Suite 502
Phoenix, Az 85004-1481

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) MARTA HETNER C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5951

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

PHOENIX AZ SSD

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- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Adrian M. Gough, Esq
Deputy County Attorney
222 N. Central Ave,
Suite 1100
Phoenix, Az 85004

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Holly Carlson C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5968

PS Form 3811, February 2004 Domestic Return Receipt 102595-02

Item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Regency Place LLC
Insight Holdings LLC /etal
2200 Paseo Verde Pkwy Ste 330
Henderson, NV 89052

X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Lisa DeHaan C. Date of Delivery 7/21

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 2680 0002 9601 5838

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

Item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Az. Reporting Services Inc.
2200 N. Central St.
Suite 502
Phoenix, Az 85004-1481

X [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) Dennis Bretcher C. Date of Delivery 7-21-08

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7007 0220 0002 9601 5746

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

Item 4 if Restricted Delivery is desired.
Print your name and address on the reverse so that we can return the card to you.
Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Liz Aman - UPRR
301 E. Harrison St.
Phoenix, Az. 85034-2396

ARIZONA CORPORATION COMMISSION

DAVID RABER
Director, Safety Division

Staff Memorandum

To: THE COMMISSION DOCKET NO. RR-03639A-08-0311

From: Safety Division

Date: August 11, 2008

RE: IN THE MATTER OF THE APPLICATION OF THE MARICOPA COUNTY DEPARTMENT OF TRANSPORTATION TO UPGRADE AN EXISTING CROSSING OF THE UNION PACIFIC RAILROAD AT SARIVAL AVENUE IN THE CITY OF GOODYEAR, MARICOPA COUNTY, ARIZONA, AT AAR/DOT NO. 741-782-L.

Background

On June 19, 2008, the Maricopa County Department of Transportation ("MCDOT") filed with the Arizona Corporation Commission ("Commission") an application for approval for the Union Pacific Railroad ("Railroad") to upgrade an existing crossing at the Railroad's tracks at Sarival Avenue, in the City of Goodyear, Maricopa County, Arizona at AAR/DOT No. 741-782-L.

MCDOT's filing in this application requests approval for the Railroad to upgrade an existing crossing of the Union Pacific Railroad at Sarival Avenue. MCDOT is the controlling road authority for Sarival Avenue. Flashing lights and automatic gates were first put into service at this location by Commission Decision No. 50800 in 1980.

The following is a break down of the crossing in this application, including information about the crossing that was provided to Staff by MCDOT and the Railroad.

Geographical Information

This railroad crossing is located at Sarival Avenue just north of Maricopa County Highway 85 ("MC 85") in Goodyear, Arizona (estimated population of 56,000 as of 2007). Sarival Avenue runs on a north-south trajectory with the rail line traversing Sarival Avenue on an east-west angle. For a map of the area, see Appendix A of this staff report.

Sarival Avenue

The "MC 85, Estrella Parkway to Cotton Lane Project" includes improvement of MC 85 to a six lane roadway and adding traffic signalization of the MC 85 and Sarival intersection. Currently, Sarival Avenue is a two lane road with no dedicated turn lanes. Improvements along Sarival Avenue include widening of the roadway to four lanes plus a dedicated left-hand turn lane at MC85 for southbound traffic on Sarival Ave. In addition, a 10.5 foot raised median will be installed across the Railroad right of way. The railroad crossing is located approximately 200 feet north of MC 85, and 2,400 feet south of West Elwood Street.

The Railroad will install new 12 inch LED flashing lights with automatic gates in the median and outside the roadway near the sidewalk, as well as a new concrete crossing surface. Additionally, there will be cantilevers with 12 inch LED flashing lights installed for both directions of traffic. These improvements will replace the existing incandescent flashing lights and gate mechanisms as well as the timber crossing surface. Constant warning time circuitry will also be installed as part of this crossing improvement project. A traffic preemption circuit will interconnect the constant warning time detection system of the Railroad, to the traffic signal controller to allow the intersection to clear prior to the arrival of a train. The proposed measures are consistent with safety measures employed at similar at-grade crossings in the state.

Traffic data for Sarival Avenue was provided by MCDOT's website, and was collected in 2006. The Average Daily Traffic (ADT) counts show 1,656 vpd. The Maricopa Association of Governments ("MAG") projects the ADT to be 6,099 vpd in 2030. Information taken from the *July 1998 MC Highway 85, State Route 85 at Oglesby to 75th Avenue Final Corridor Improvement Study, Section 3.2.2 Unsignalized Intersections*, states the intersection of MC 85 and Sarival Avenue operates at Level of Service (LOS) A in the existing condition utilizing the 1997 ADT's.

Traffic information obtained from the *July 2006 Access Control and Corridor Improvement Study, MC 85 75th Ave to Turner Rd, Section 3.3 Future Year Conditions and Level of Service*, indicates the intersection of MC 85 and Sarival Avenue will operate at a LOS B utilizing 2026 projected traffic data. This analysis assumed that MC 85 will be upgraded to a six lane roadway section.

Note: The American Association of State Highway and Transportation Officials (AASHTO) Geometric Design of Highways and Streets, 2004, states that the Level of Service characterizes the operating conditions on a facility in terms of traffic performance measures related to speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. This is a measure of roadway congestion ranging from LOS A--least congested--to LOS F--most congested. LOS is one of the most common terms used to describe how "good" or how "bad" traffic is projected to be.

The posted speed limit on Sarival Avenue is 45 MPH. Commission Rail Safety Section, as well as Federal Railroad Administration ("FRA") accident/incident records indicate no train/vehicle accidents on Sarival Avenue.

Regarding alternative routes from this crossing, to the west approximately one mile is Cotton Lane and to the east approximately one mile is Estrella Parkway. Both crossings are at-grade crossings.

The estimated cost of the railroad crossing improvements is $575,057. MCDOT and the City of Goodyear are sharing the cost of the crossing improvements.

Train Data

Data provided by the Railroad regarding train movements through this crossing are as follows:

Train Count: Average of 2-3 trains per day
Train Speed: 25 mph
Thru Freight/Switching Moves: There are thru train movements as well as switching movements at this crossing.

Schools and Bus Routes

Information about schools and school buses in the area was provided by MCDOT. There are ten schools near the Sarival Avenue crossing. The Sarival Avenue crossing is in the Avondale Elementary School District No. 44 and Agua Fria Union High School District. The following are the schools in the districts:

High Schools:

- ✓ Agua Fria Union High School, 750 East Riley Drive, Avondale 85323
- ✓ Estrella High School, 5100 N. Central Ave, Avondale, 85323

Elementary Schools:

- ✓ Centerra Mirage School , 15151 W Centerra Dr. South Goodyear, AZ 85338
- ✓ Desert Star School , 2131 South 157th Avenue Goodyear, AZ
- ✓ Desert Thunder School , 16750 W. Garfield Goodyear, AZ 85338
- ✓ Lattie Coor School , 1406 N. Central Avenue Avondale, AZ 85323
- ✓ Michael Anderson School, 45 S. 3rd Ave, Avondale, AZ 85323
- ✓ Wildflower School, 325 S. Wildflower Drive, Goodyear AZ 85338

- ✓ Copper trails School, 16875 West Canyon Trails Blvd, Goodyear, AZ 85338

- ✓ Eliseo C. Felix School, 540 La Pasada Goodyear, AZ 85338

Per a phone conversation with Lynn Rumble (Avondale Elementary School District Transportation Supervisor), there is one school bus that crosses this intersection twice daily. On August 8, 2008, Staff verified with Ms. Rumble that the bus trip information is correct. Additionally, she stated the Railroad is conscious about the length of time the Sarival crossing is blocked during their switching operations. Ms. Rumble said there is no issue with the Railroad excessively blocking this crossing.

Hazardous Materials

Staff asked MCDOT if they knew of any hazardous material traffic across this crossing, and this was their answer:

We are unable to provide specific traffic counts for vehicle carrying hazardous materials. Based on information from the Maricopa County Department of Transportation, there are no restrictions on vehicles carrying hazardous materials on this roadway. Sarival Avenue is not registered in the National Hazardous Material Route Registry.

Hospitals

The main hospital in the area is West Valley Hospital located at 13677 W. McDowell Road, Goodyear, Arizona 85395, which is approximately 7.5 miles away from the intersection. Per a phone conversation with hospital personnel, MCDOT was advised that the emergency service vehicles select their route based on the shortest distance to their destination.

Zoning

MCDOT gave the following response as to how the surrounding areas from this crossing are zoned:

The parcels north of the railroad crossing is identified as City Code Zone I-2 - General Industrial Park, and the parcels to the south of the tracks are identified as City Zone Code PAD- Planned Area Development, which are intended to accommodate and promote residential and non residential developments. The area to the south of the tracks is currently farm land but residential developments are anticipated.

Spur Lines

MCDOT was unable to obtain any information about spur lines in this area from the railroad.

Grade Separation

With regard to grade separating Sarival Avenue, MCDOT gave the following response:

No studies were performed to evaluate if an overpass was required. With the proposed improvements to the intersection of MC 85 and Sarival Avenue and the close proximity of the railroad crossing from the proposed intersection (approximately 200-ft north of MC 85) the location of the at-grade crossing remains unchanged. A grade separation would have the following undesirable consequences:

- ***Access to existing businesses along Sarival Avenue would be severed for approximately 2,300-ft north of the railroad tracks.***
- ***Access to existing farm fields along MC 85 would be severed for approximately 4,600-ft along MC 85 (2,300-ft east and west of Sarival Avenue).***
- ***There are several existing utilities in Sarival Avenue that cannot support 30-ft of additional embankment needed for a grade-separated crossing.***
- ***There is insufficient right-of-way to accommodate 30-ft high embankment slopes along Sarival Avenue and MC 85.***

MCDOT's initial calculations yield a cost of $20,000,000 to construct a grade separated crossing. The following are included in the cost for a bridge over the UPRR tracks;

- ***The cost for retaining walls along the east and west legs of MC 85 and the north leg of Sarival Avenue in order to retain slopes within the existing right of way.***
- ***The cost for new right of way along the south leg of Sarival Avenue as the County does not have any existing right of way along the south leg of Sarival Avenue.***
- ***The cost to reconstruct Sarival Avenue as needed due to the bridge construction.***

FHWA GUIDELINES

The Federal Highway Administration (FHWA) Railroad-Highway Grade Crossing Handbook (Revised Second Edition August 2007) provides nine criteria for determining whether highway-rail crossings should be considered for grade separation or otherwise eliminated across the railroad right of way. The Crossing Handbook indicates that grade separation or crossing elimination should be considered whenever one or more of the nine conditions are met. The nine criteria are applied to this crossing application as follows:

		Sarival Ave.
The highway is a part of the designated Interstate Highway System	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The highway is otherwise designed to have full controlled access	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
The posted highway speed equals or exceeds 70 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
AADT exceeds 100,000 in urban areas or 50,000 in rural areas	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Maximum authorized train speed exceeds 110 mph	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
An average of 150 or more trains per day or 300 million gross tons/year	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Crossing exposure (trains/day x AADT) exceeds 1M in urban or 250k in rural; or passenger train crossing exposure exceeds 800k in urban or 200k in rural	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO
Expected accident frequency for active devices with gates, as calculated by the US DOT Accident Prediction Formula including five-year accident history, exceeds 0.5	Crossing Currently meets the criteria[1]	NO
	Crossing meets the criteria by 2030	Unknown
Vehicle delay exceeds 40 vehicle hours per day	Crossing Currently meets the criteria	NO
	Crossing meets the criteria by 2030	NO

[1] The Accident Prediction Formula predicts the accident frequency for this crossing to be 0.008717.

Vehicular Delays at Crossings

Based on the current single track configuration, MCDOT gave the following response about delay time for vehicles at the crossing in this application. ***The delay time is measured from the point that the warning devices are activated at the crossing to the time after the train has cleared the crossing and the warning devices are reset.***

1) ***Traffic blocking delay per train is 282 seconds for a train passing the crossing (0.42 veh-hr per train).***

2) ***Traffic blocking delay per train is 635 seconds for a train stopped at the crossing (2.15 veh-hr per train).***

Crossing Closures

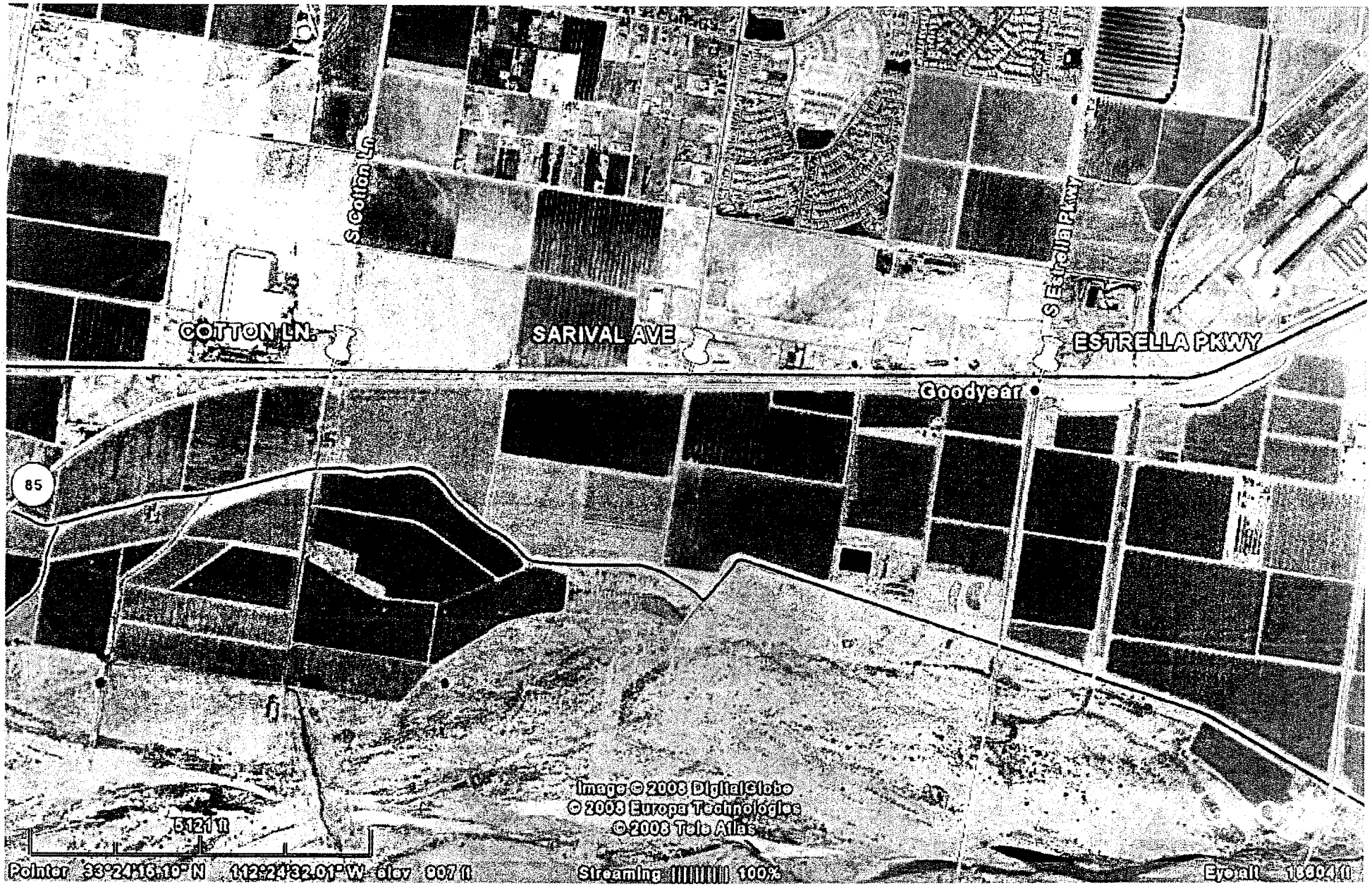
Given the amount of growth in the area, and the projected future ADT, Staff would not recommend a closure of Sarival Avenue at this time.

Staff Conclusions

Having reviewed all applicable data, Staff supports MCDOT's application. Staff believes that the upgrades are in the public interest and are reasonable. Therefore, Staff recommends approval of this application.

Dave Raber
Director
Safety Division

Brian H. Lehman
Railroad Supervisor
Safety Division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